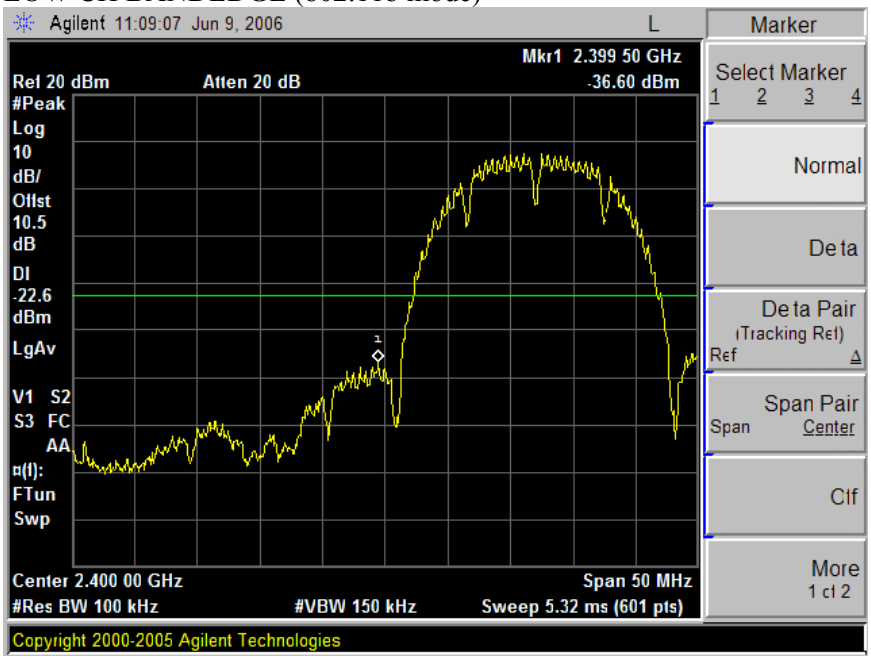
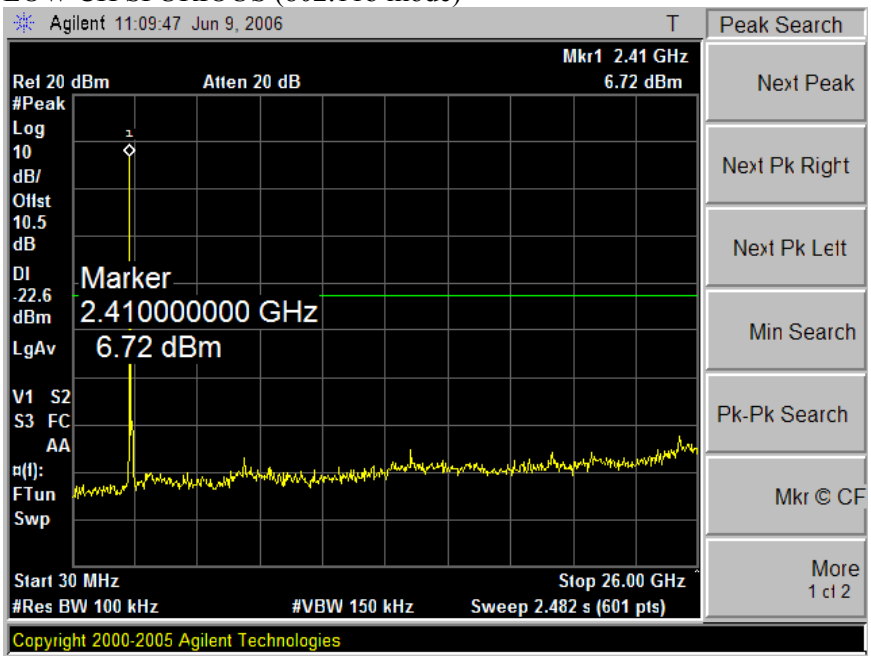
CHAIN 0

SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE)

LOW CH BANDEDGE (802.11b mode)



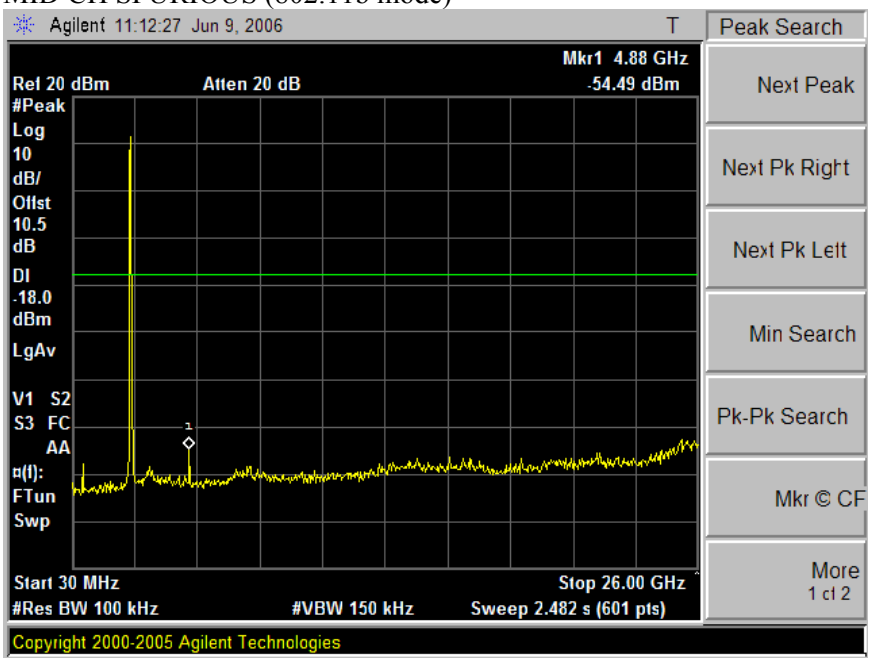
LOW CH SPURIOUS (802.11b mode)



SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE)

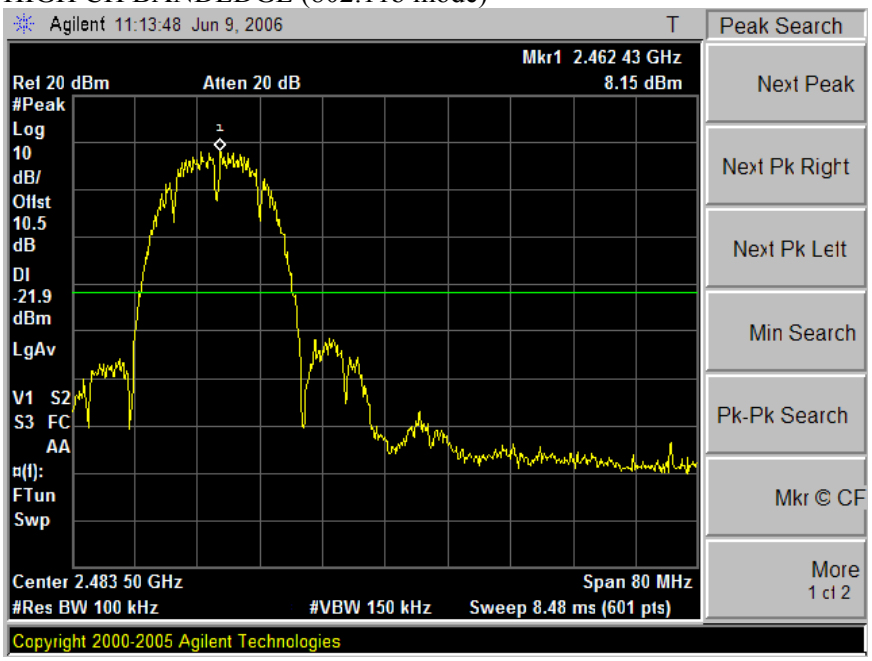
MID CH REFERENCE (802.11b mode)

MID CH SPURIOUS (802.11b mode)

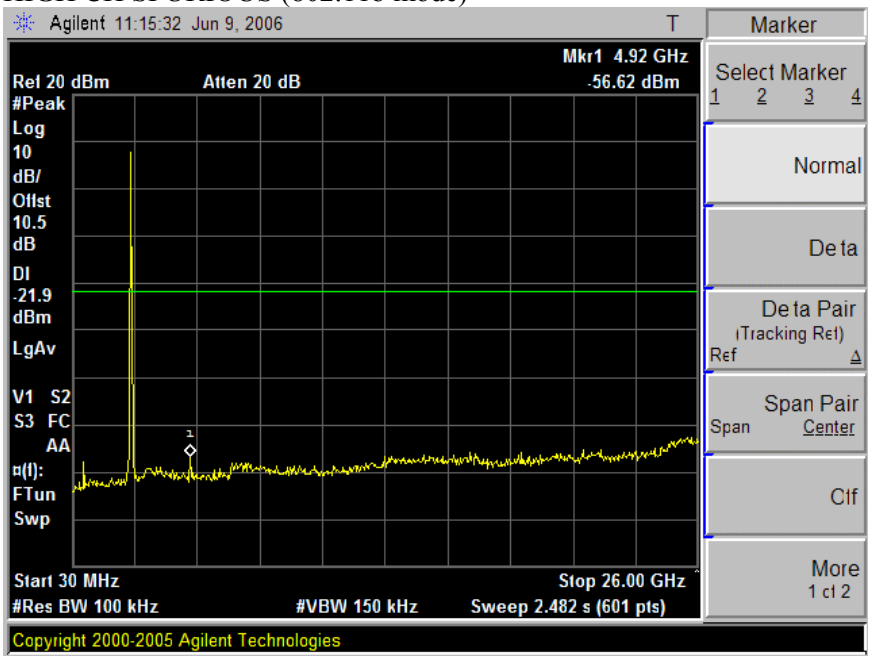


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE)

HIGH CH BANDEDGE (802.11b mode)

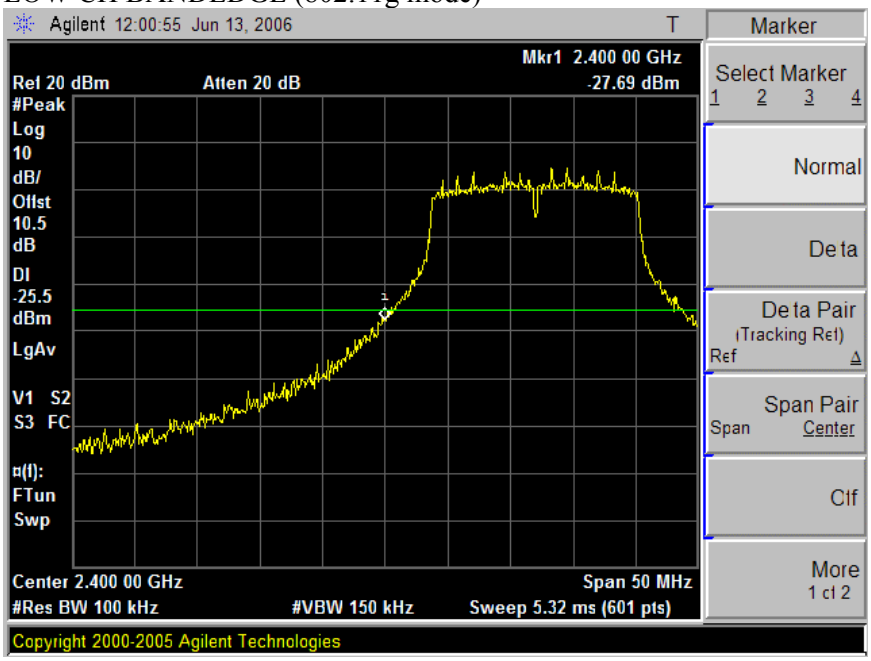


HIGH CH SPURIOUS (802.11b mode)

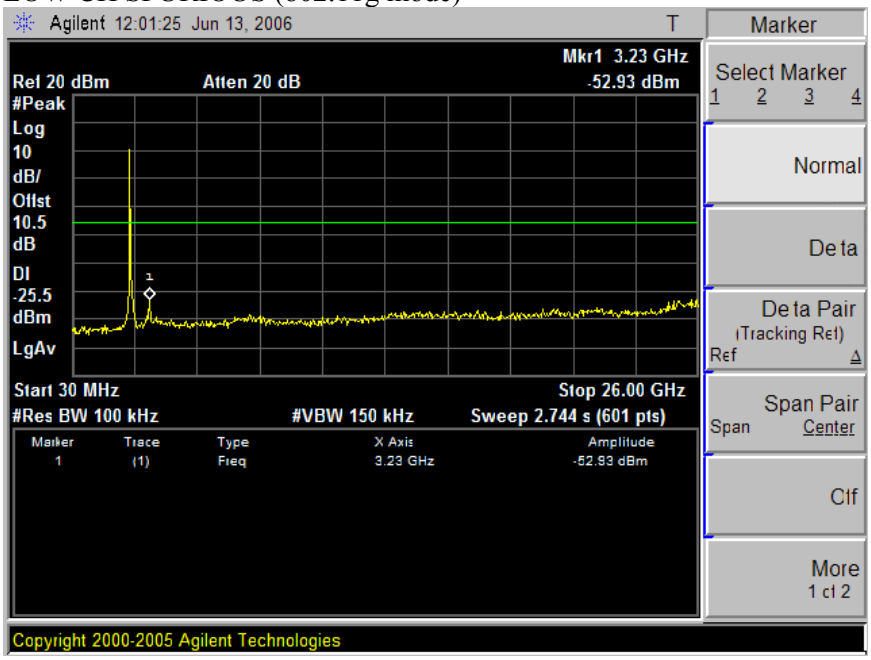


SPURIOUS EMISSIONS, LOW CHANNEL (802.11g MODE)

LOW CH BANDEDGE (802.11g mode)

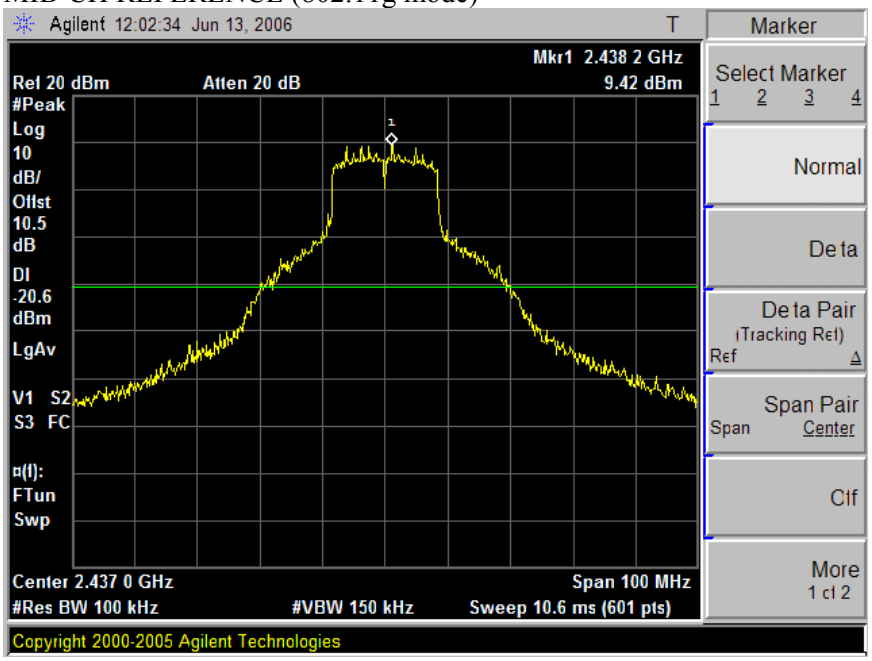


LOW CH SPURIOUS (802.11g mode)

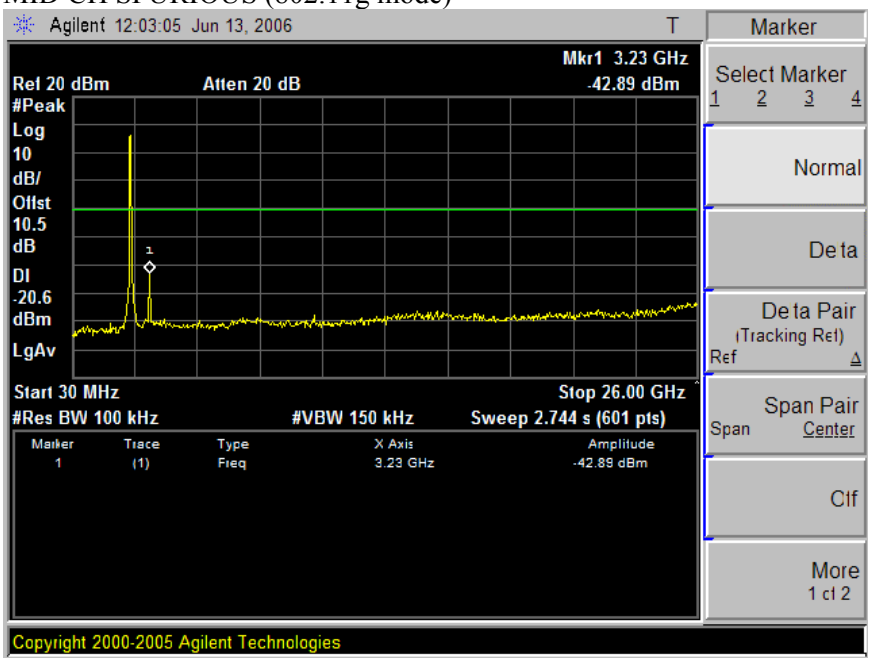


SPURIOUS EMISSIONS, MID CHANNEL (802.11g MODE)

MID CH REFERENCE (802.11g mode)

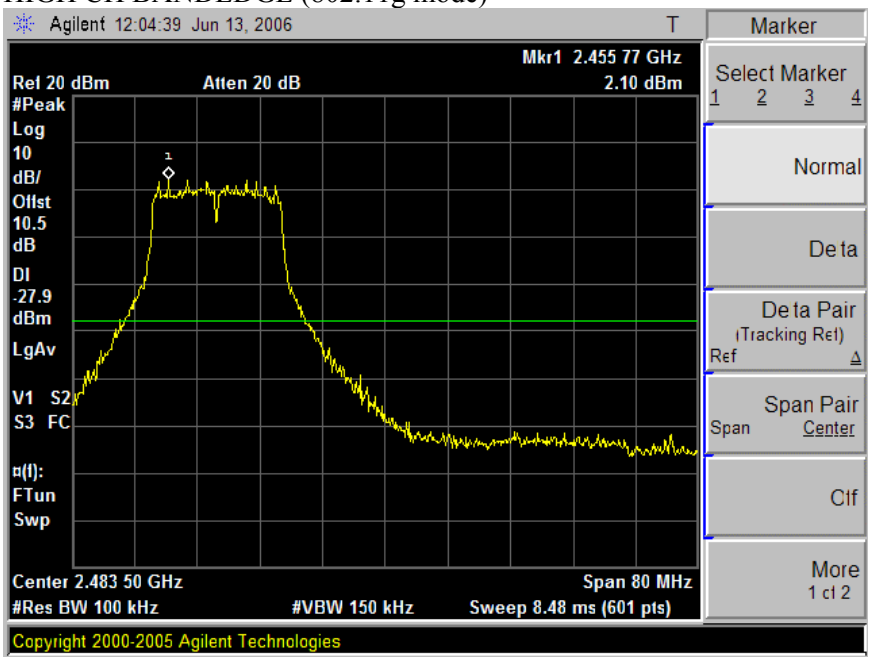


MID CH SPURIOUS (802.11g mode)

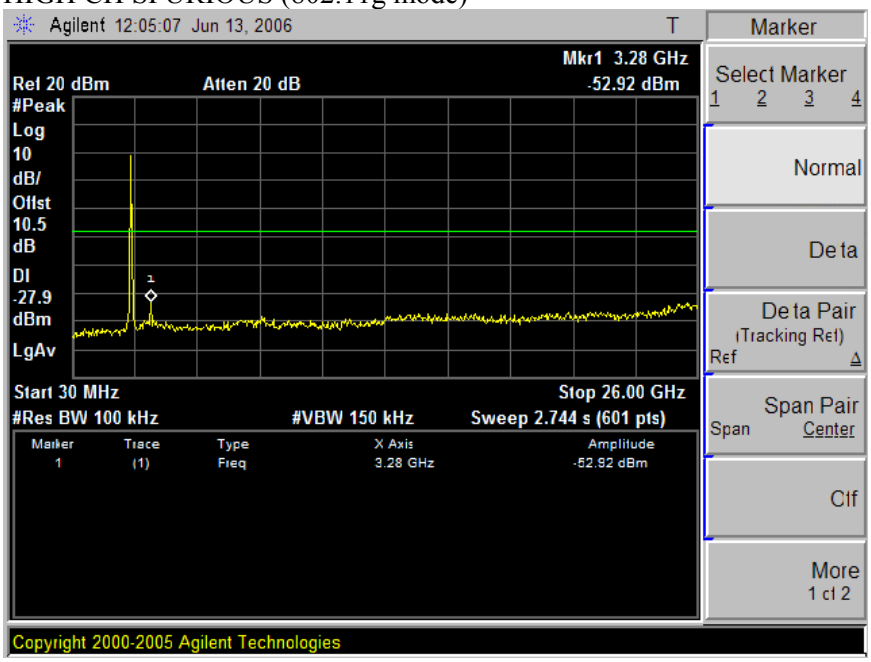


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g MODE)

HIGH CH BANDEDGE (802.11g mode)

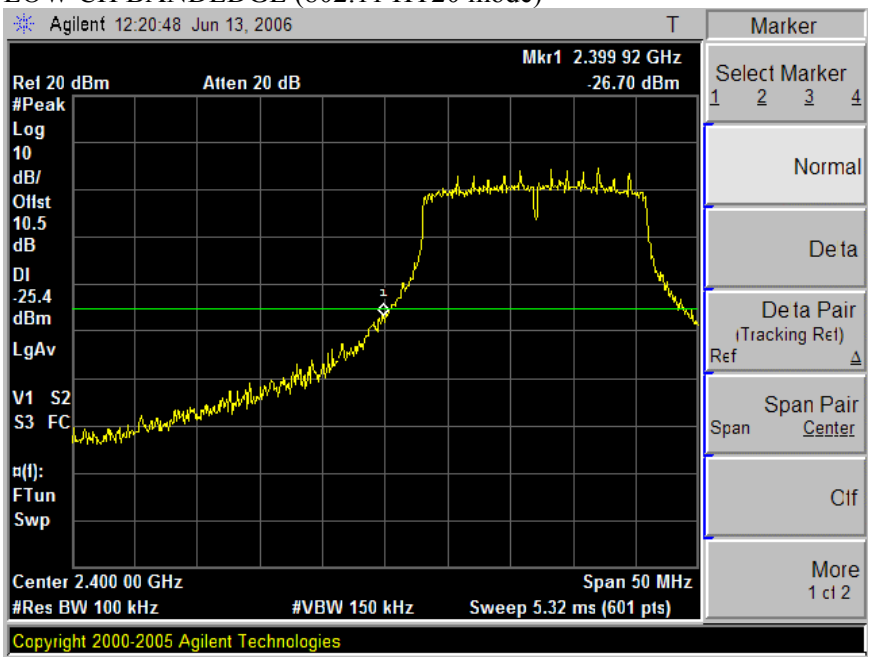


HIGH CH SPURIOUS (802.11g mode)

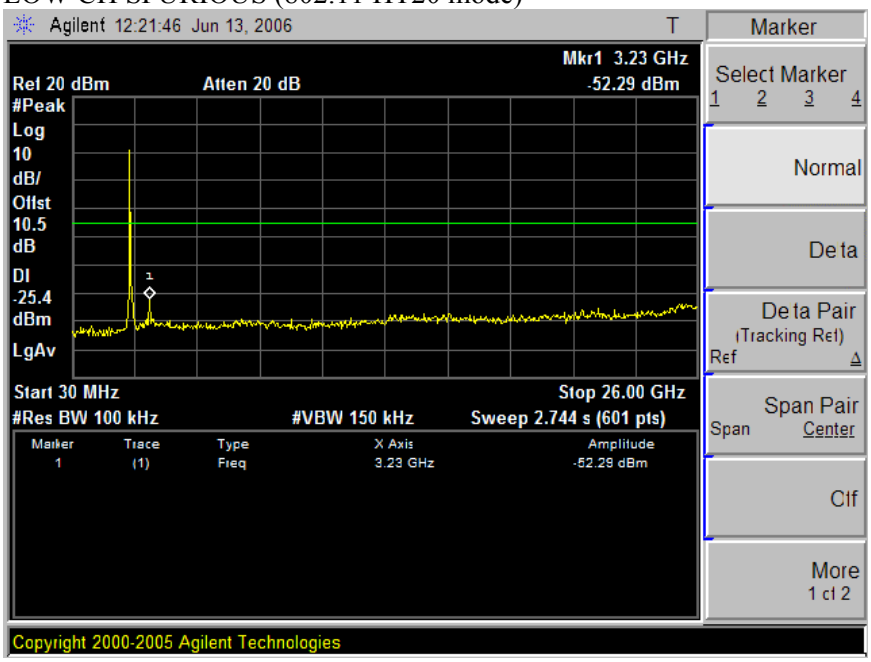


SPURIOUS EMISSIONS, LOW CHANNEL (802.11 HT20 MODE)

LOW CH BANDEDGE (802.11 HT20 mode)

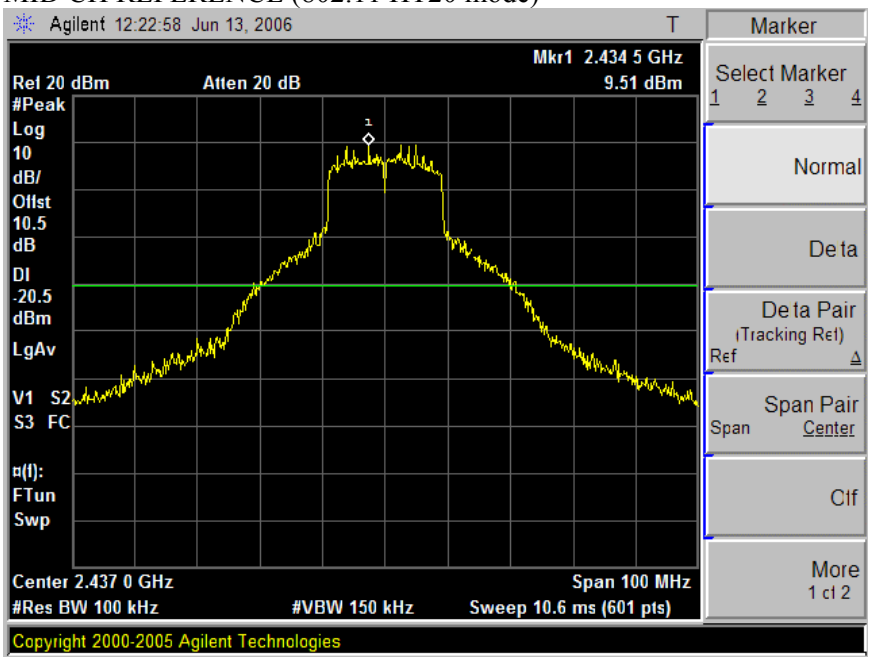


LOW CH SPURIOUS (802.11 HT20 mode)

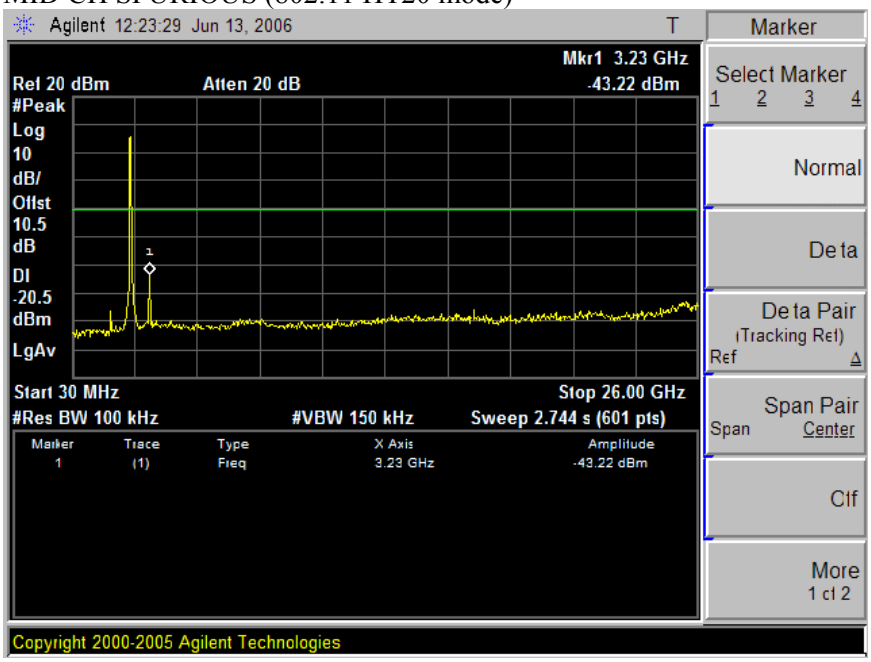


SPURIOUS EMISSIONS, MID CHANNEL (802.11 HT20 MODE)

MID CH REFERENCE (802.11 HT20 mode)

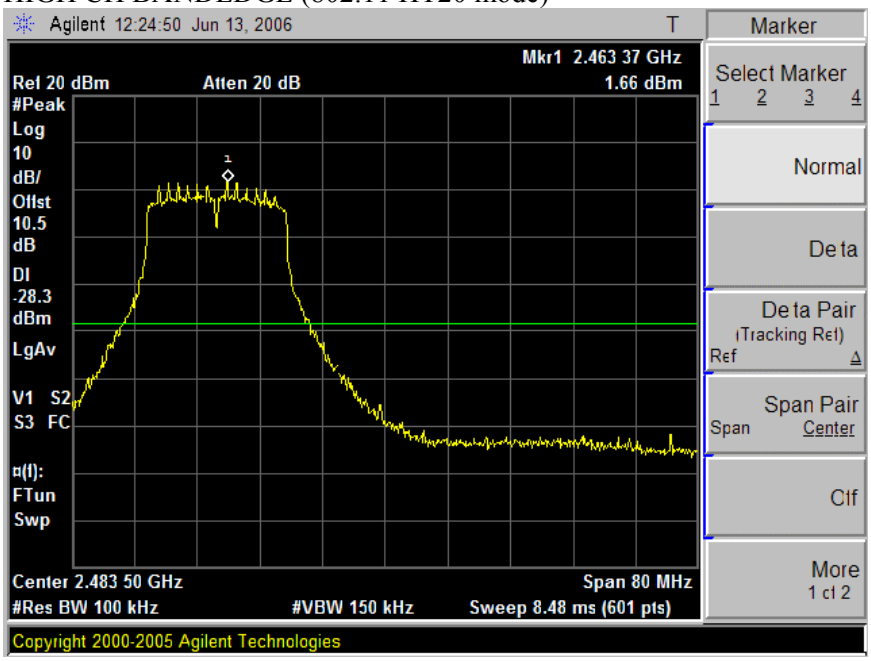


MID CH SPURIOUS (802.11 HT20 mode)

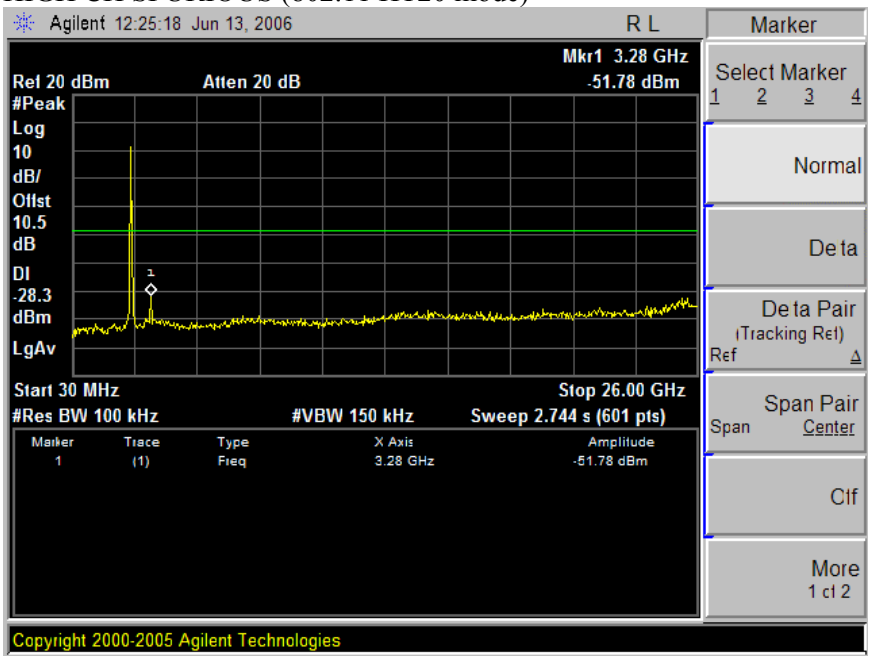


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11 HT20 MODE)

HIGH CH BANDEDGE (802.11 HT20 mode)



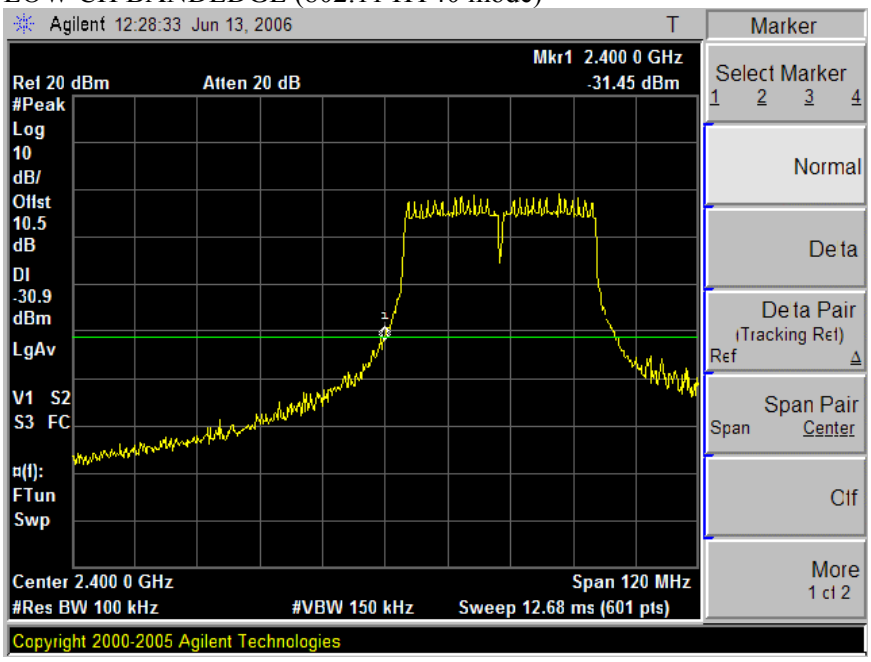
HIGH CH SPURIOUS (802.11 HT20 mode)



SPURIOUS EMISSIONS, LOW CHANNEL (802.11 HT40 MODE)

CH 2422MHz

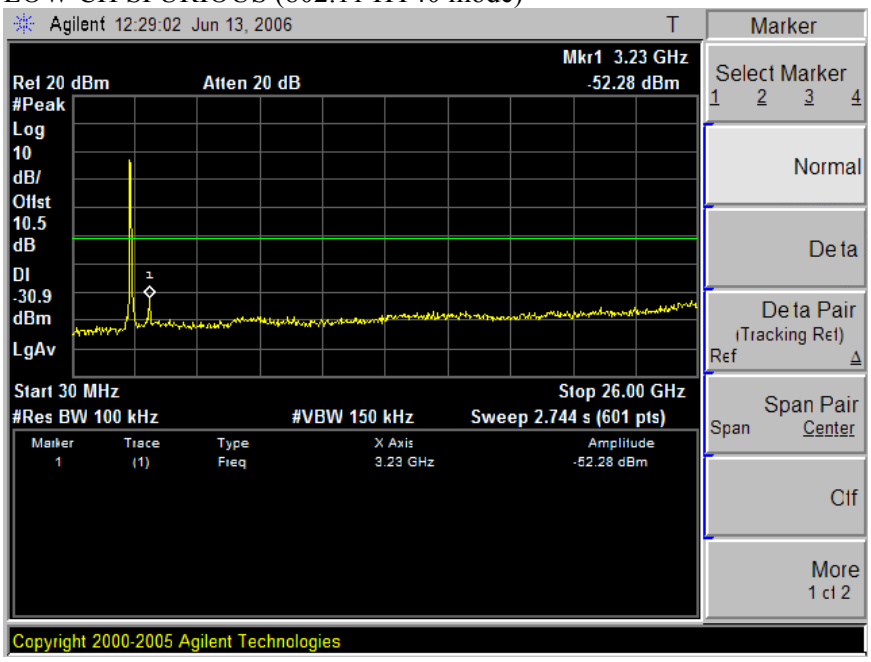
LOW CH BANDEDGE (802.11 HT40 mode)



SPURIOUS EMISSIONS, LOW CHANNEL (802.11 HT40 MODE)

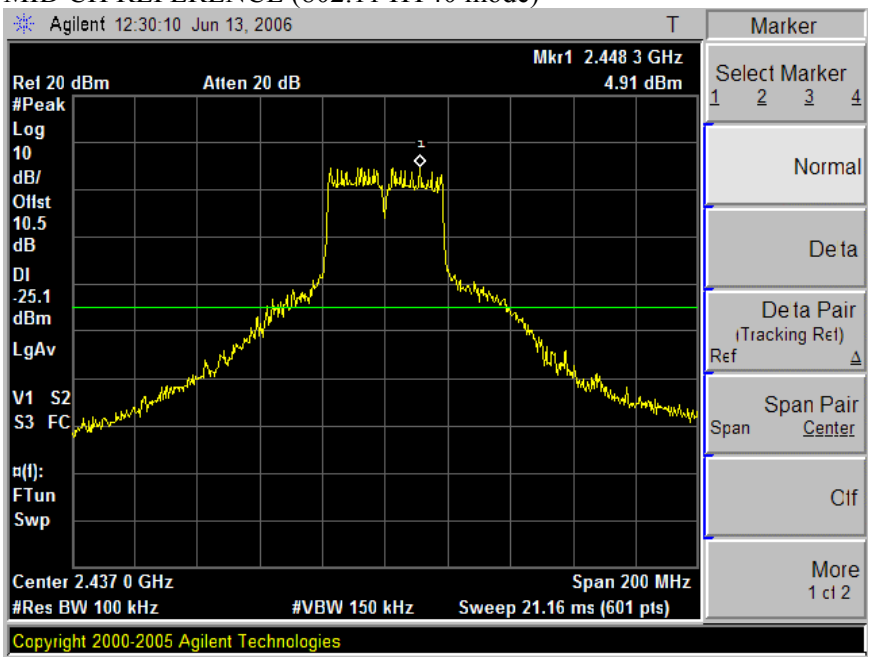
CH. 2422 MHz

LOW CH SPURIOUS (802.11 HT40 mode)

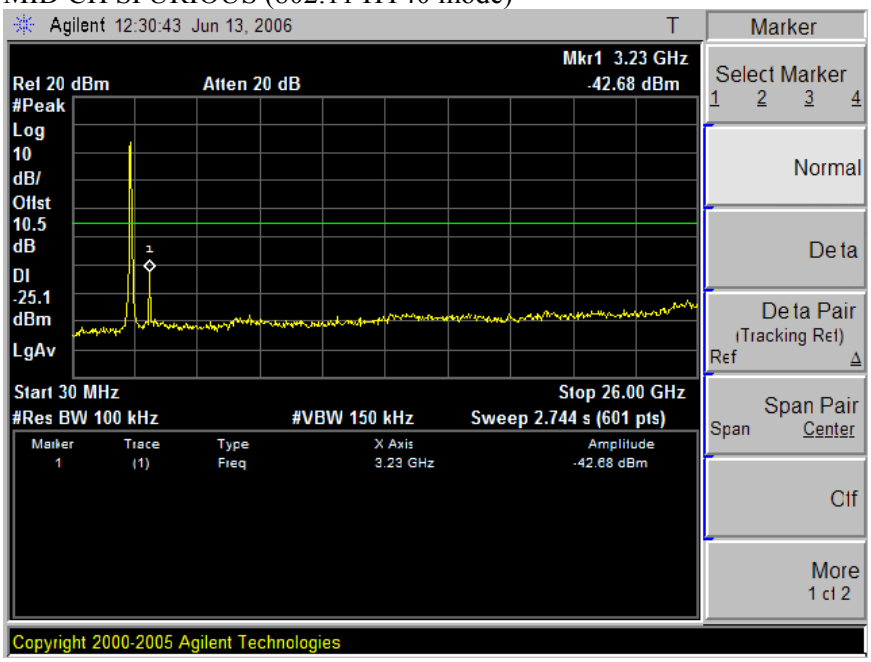


SPURIOUS EMISSIONS, MID CHANNEL (802.11 HT40 MODE)

MID CH REFERENCE (802.11 HT40 mode)



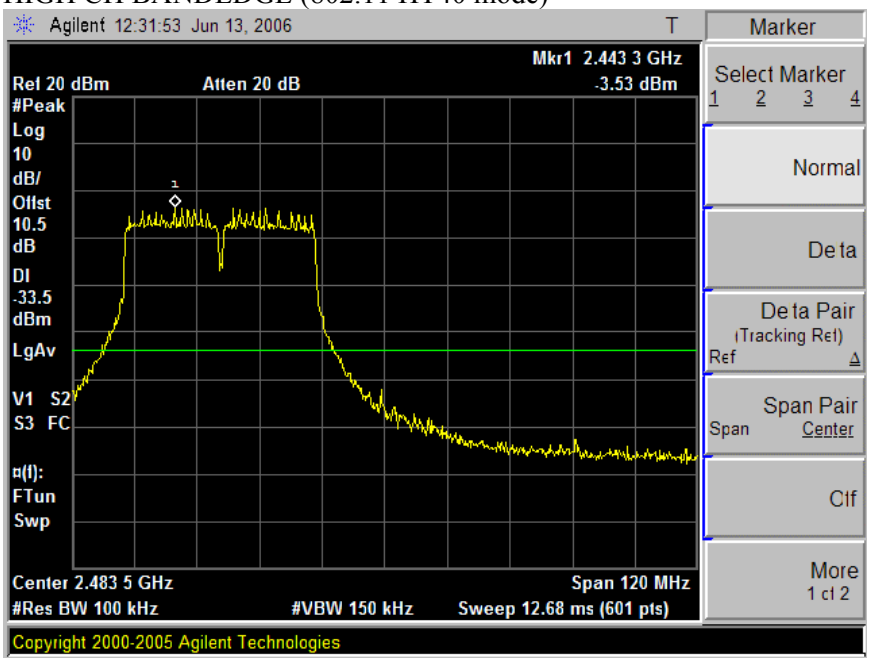
MID CH SPURIOUS (802.11 HT40 mode)



SPURIOUS EMISSIONS, HIGH CHANNEL (802.11 HT40 MODE)

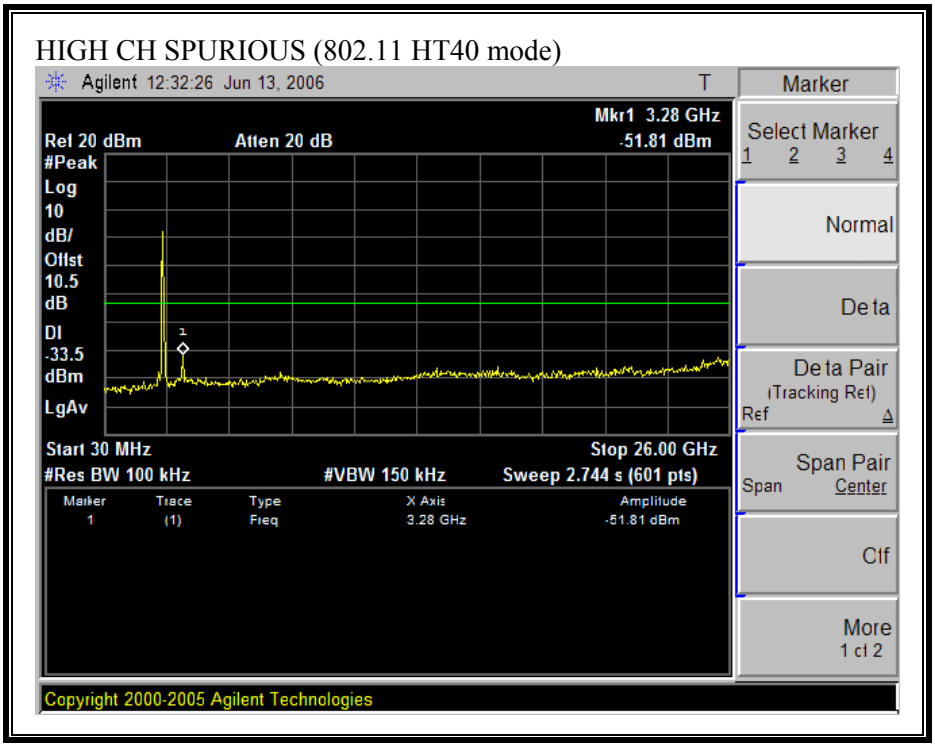
CH 2452MHz

HIGH CH BANDEDGE (802.11 HT40 mode)



SPURIOUS EMISSIONS, HIGH CHANNEL (802.11 HT40 MODE

HIGH CH SPURIOUS (802.11 HT40 mode)

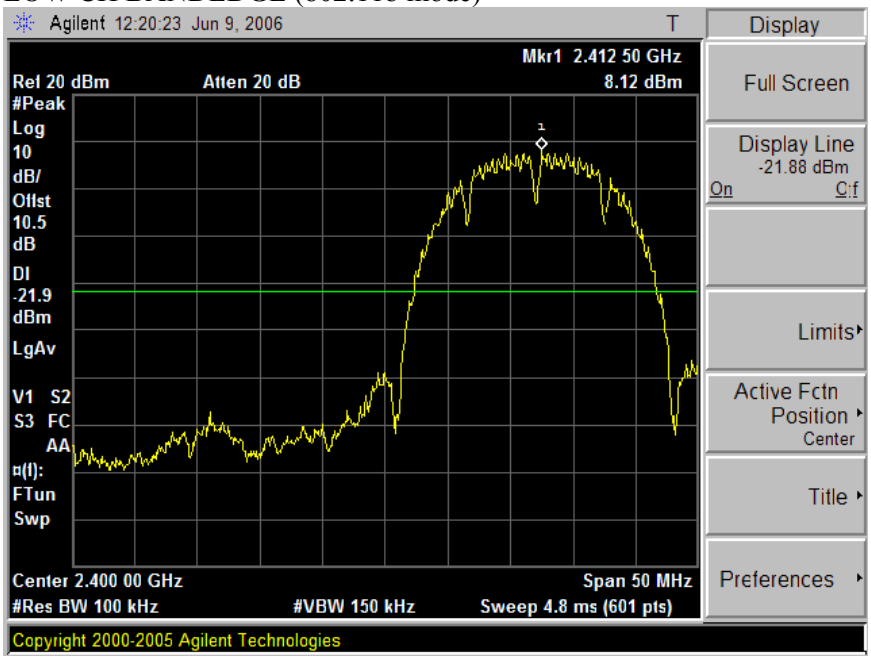


CHAIN 2

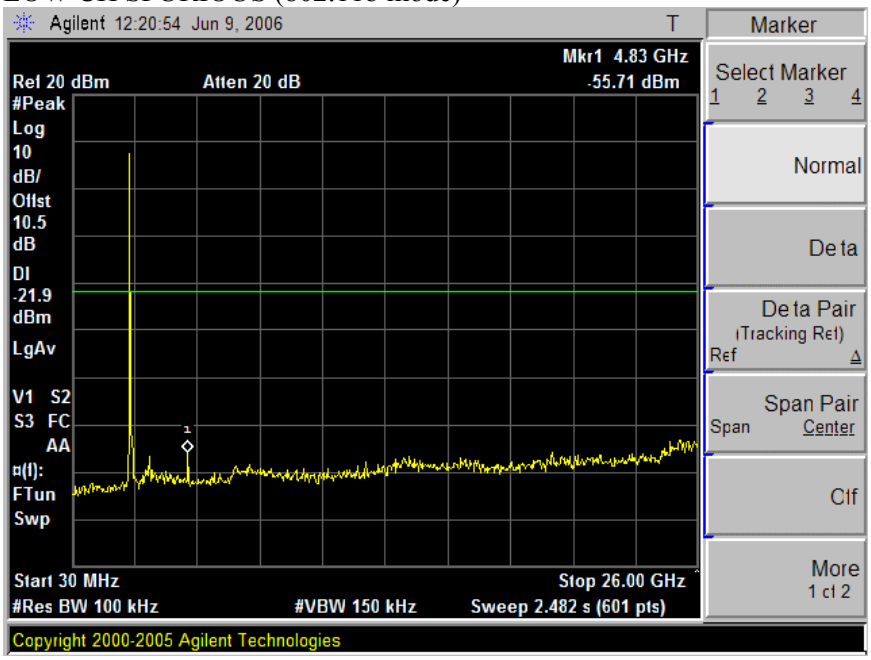
SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE)

)

LOW CH BANDEDGE (802.11b mode)

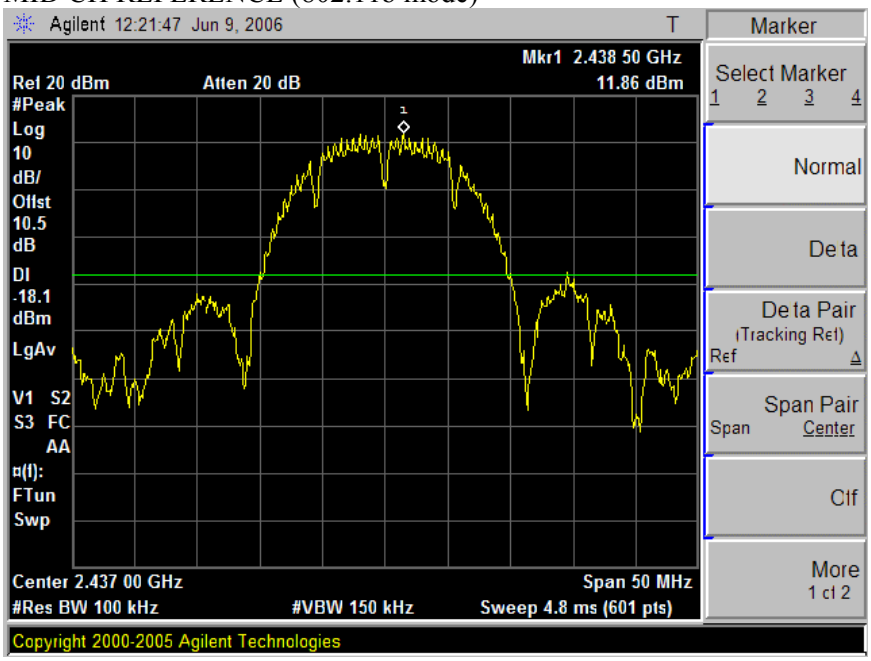


LOW CH SPURIOUS (802.11b mode)

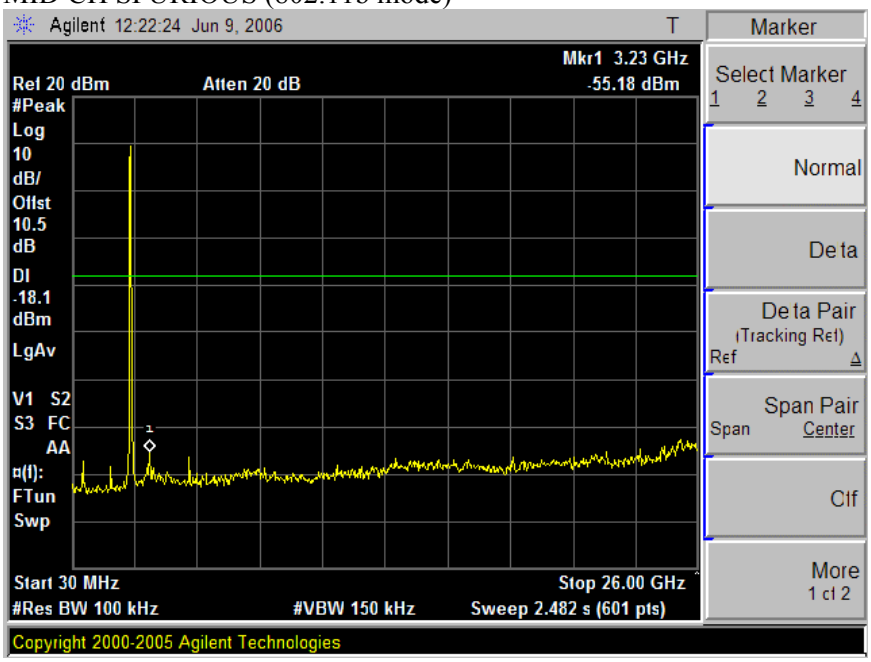


SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE)

MID CH REFERENCE (802.11b mode)

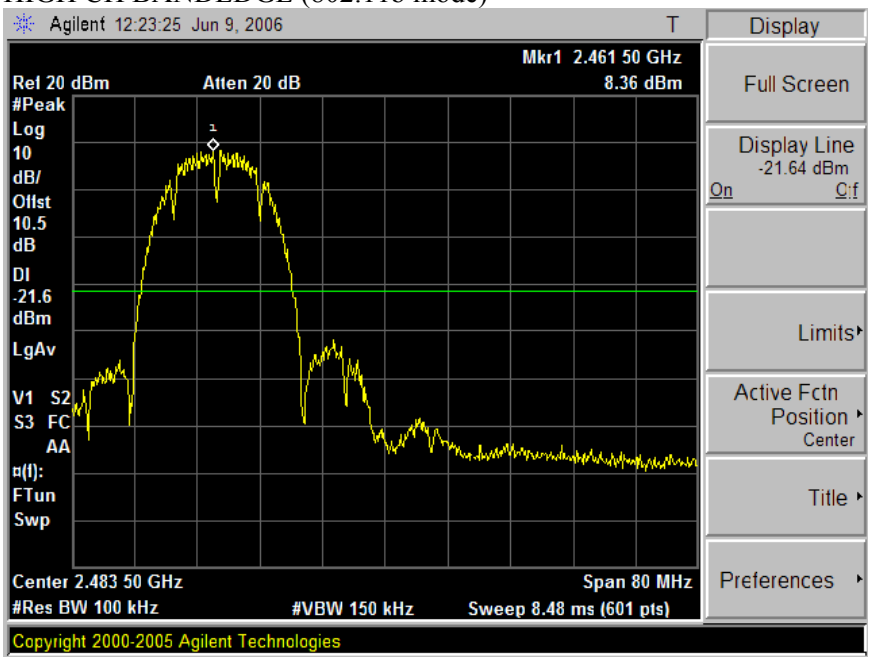


MID CH SPURIOUS (802.11b mode)

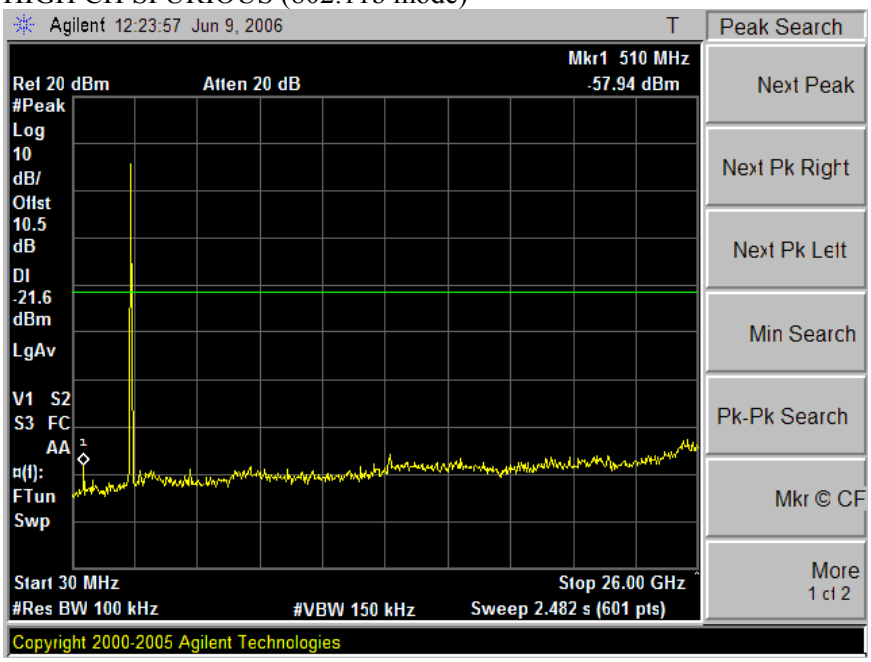


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE)

HIGH CH BANDEDGE (802.11b mode)

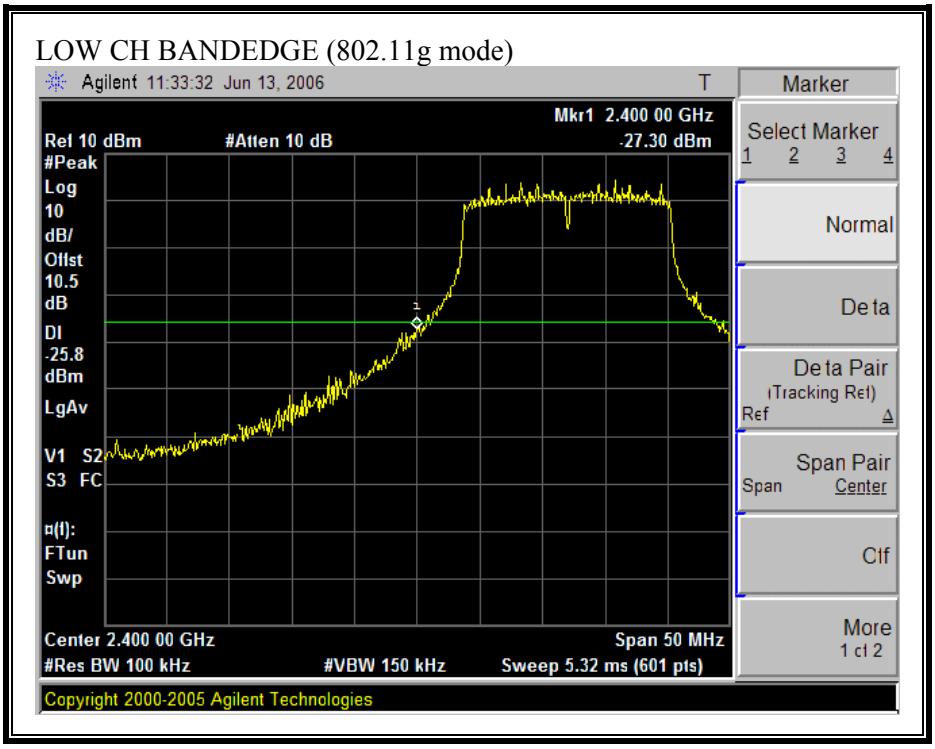


HIGH CH SPURIOUS (802.11b mode)

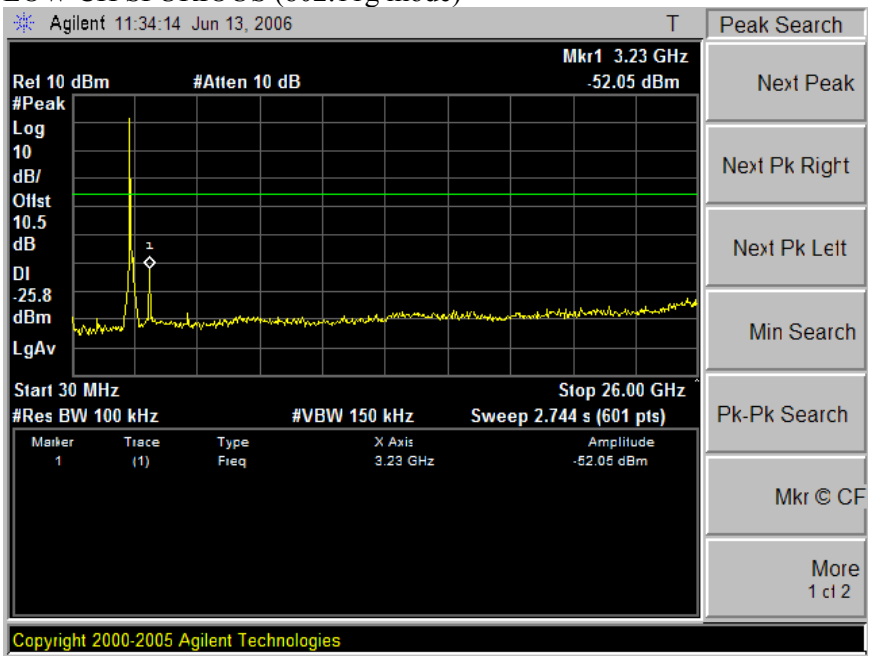


SPURIOUS EMISSIONS, LOW CHANNEL (802.11g MODE)

LOW CH BANDEDGE (802.11g mode)

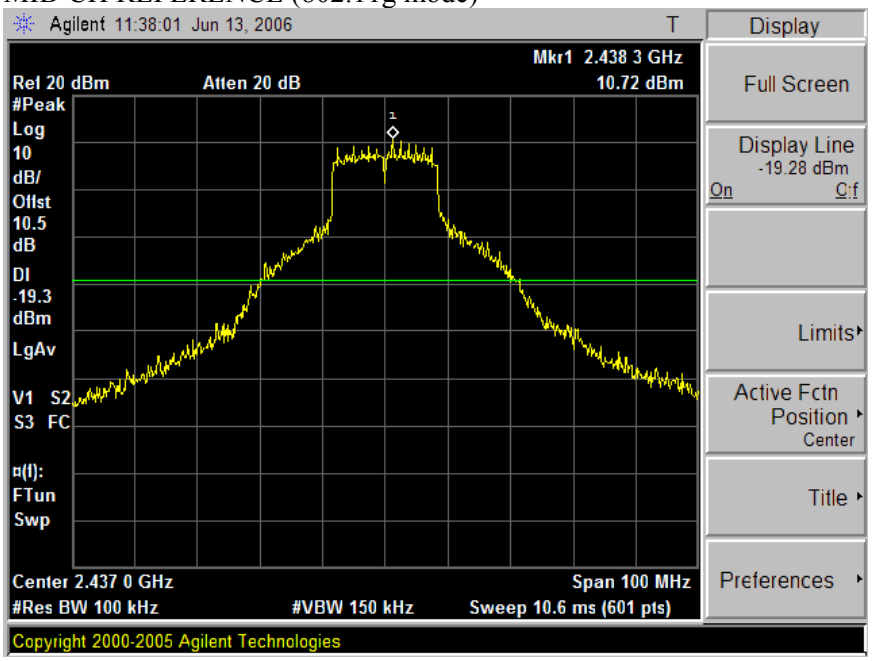


LOW CH SPURIOUS (802.11g mode)

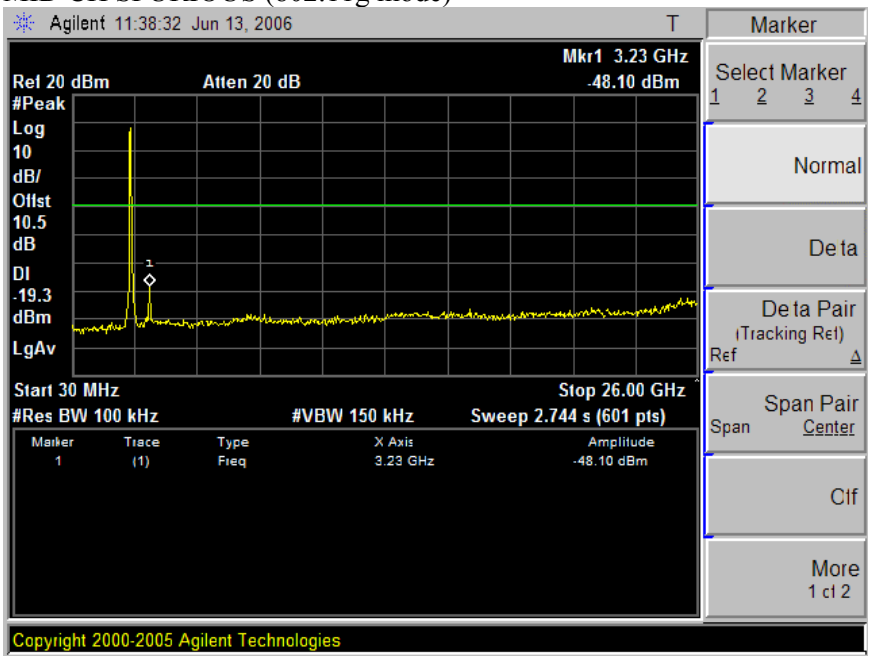


SPURIOUS EMISSIONS, MID CHANNEL (802.11g MODE)

MID CH REFERENCE (802.11g mode)

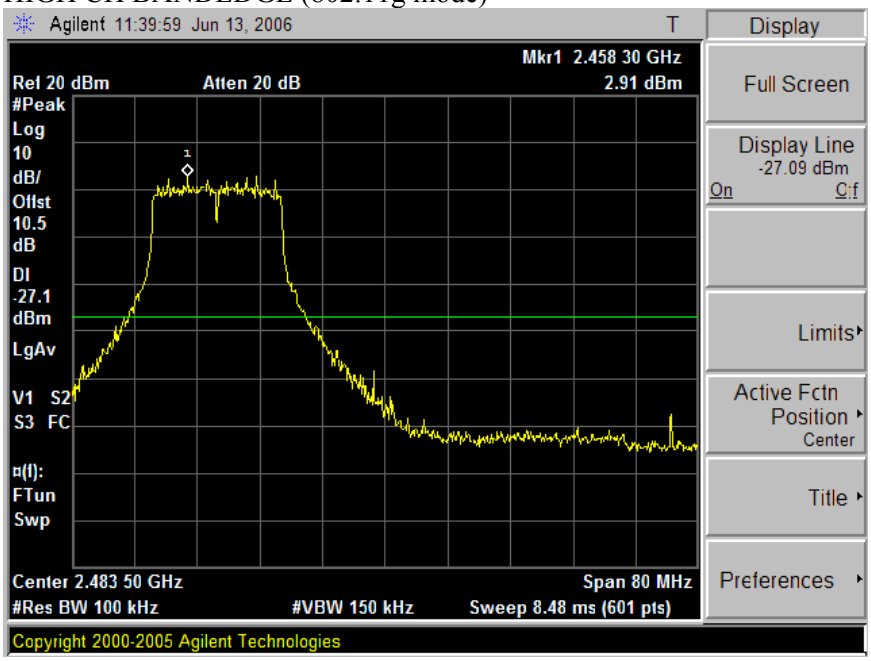


MID CH SPURIOUS (802.11g mode)

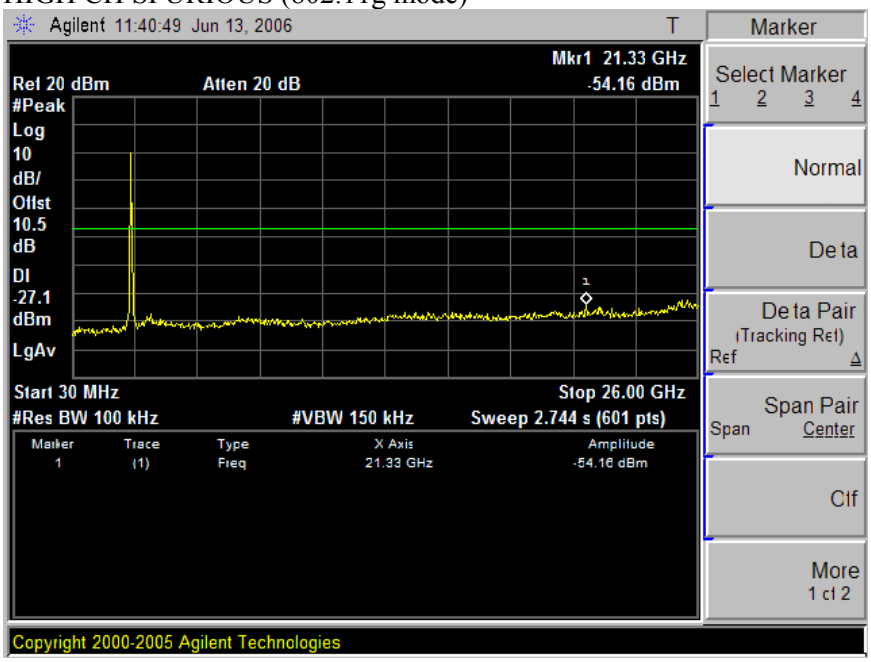


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g MODE)

HIGH CH BANDEDGE (802.11g mode)

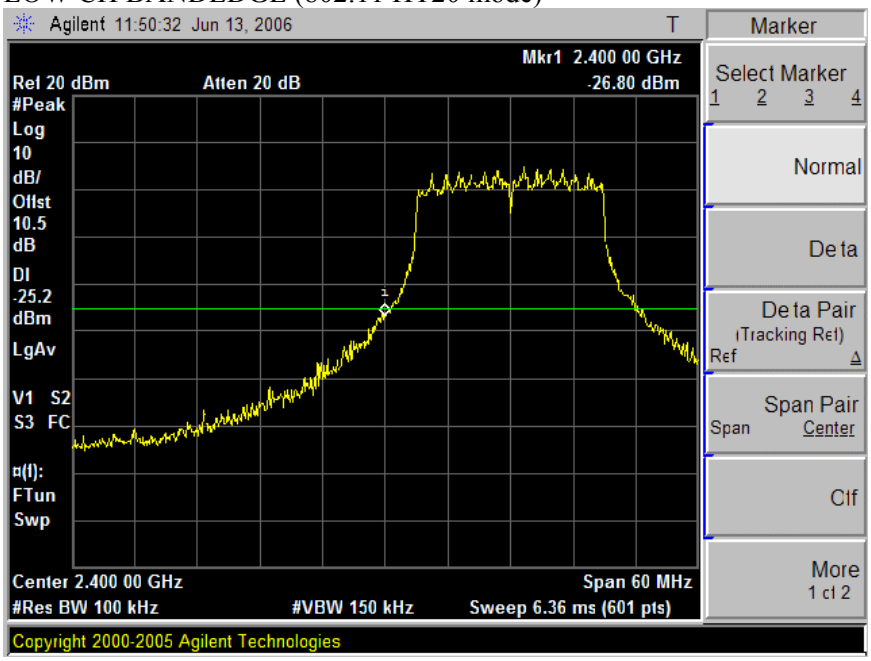


HIGH CH SPURIOUS (802.11g mode)

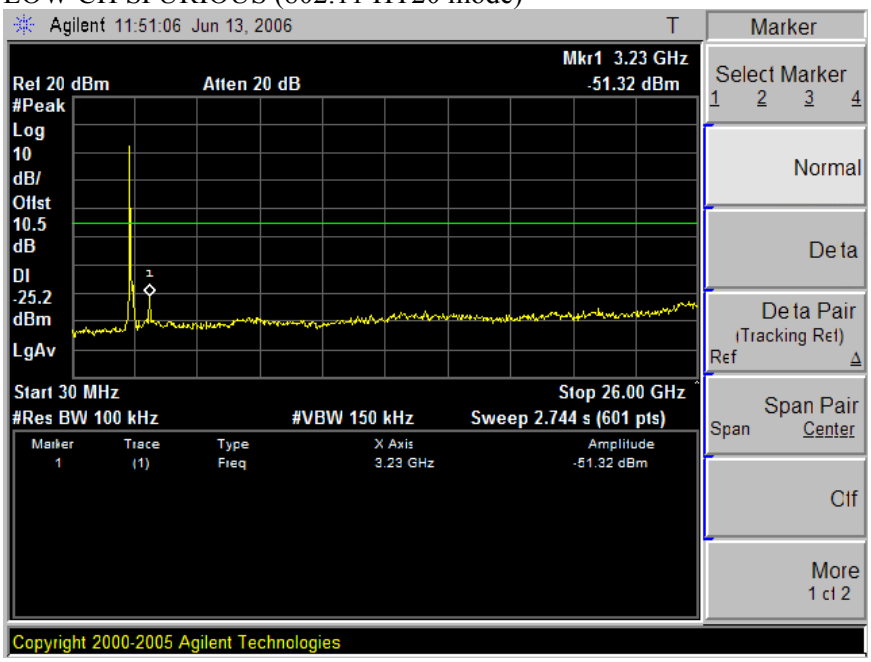


SPURIOUS EMISSIONS, LOW CHANNEL (802.11 HT20 MODE)

LOW CH BANDEDGE (802.11 HT20 mode)

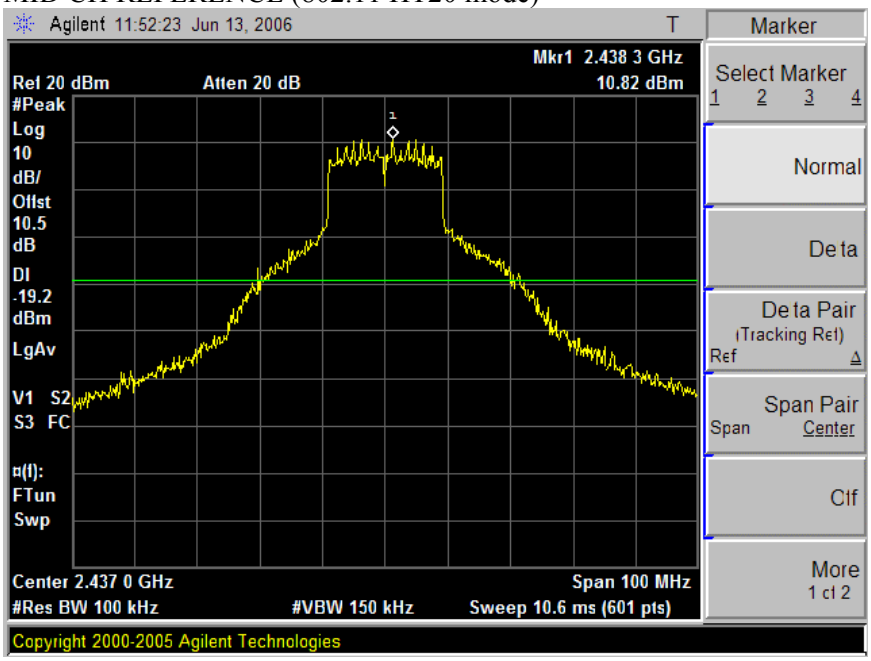


LOW CH SPURIOUS (802.11 HT20 mode)

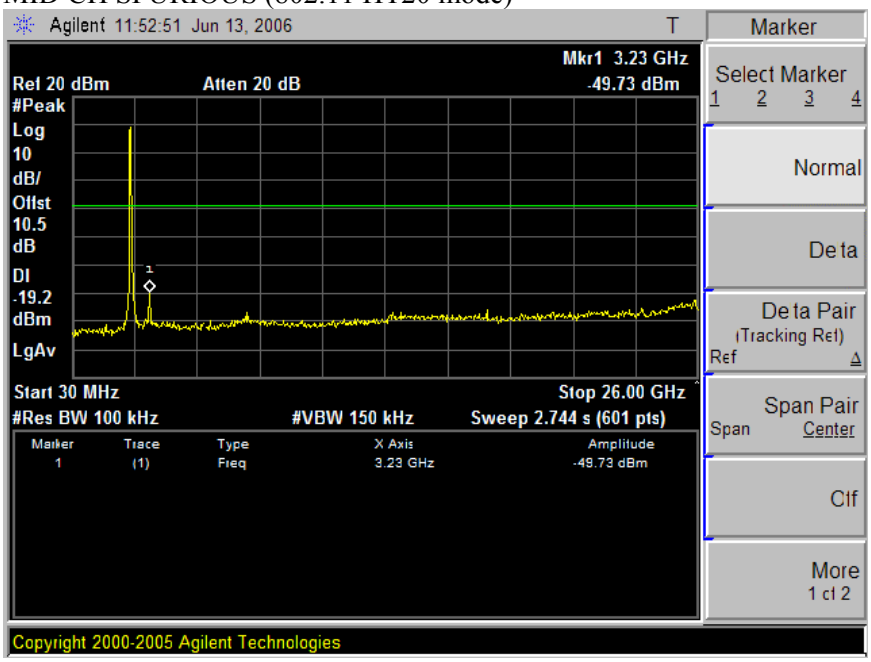


SPURIOUS EMISSIONS, MID CHANNEL (802.11 HT20 MODE)

MID CH REFERENCE (802.11 HT20 mode)

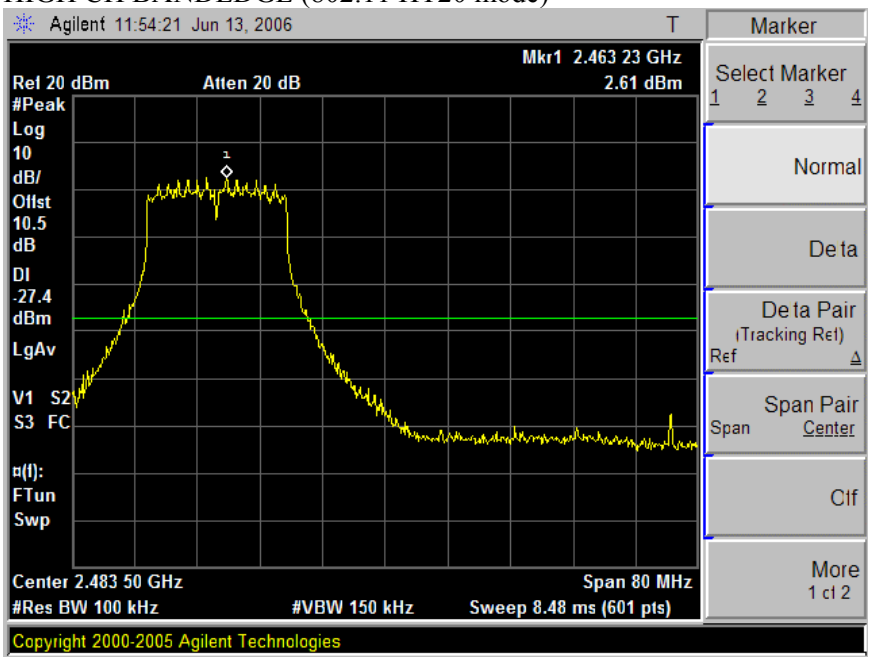


MID CH SPURIOUS (802.11 HT20 mode)

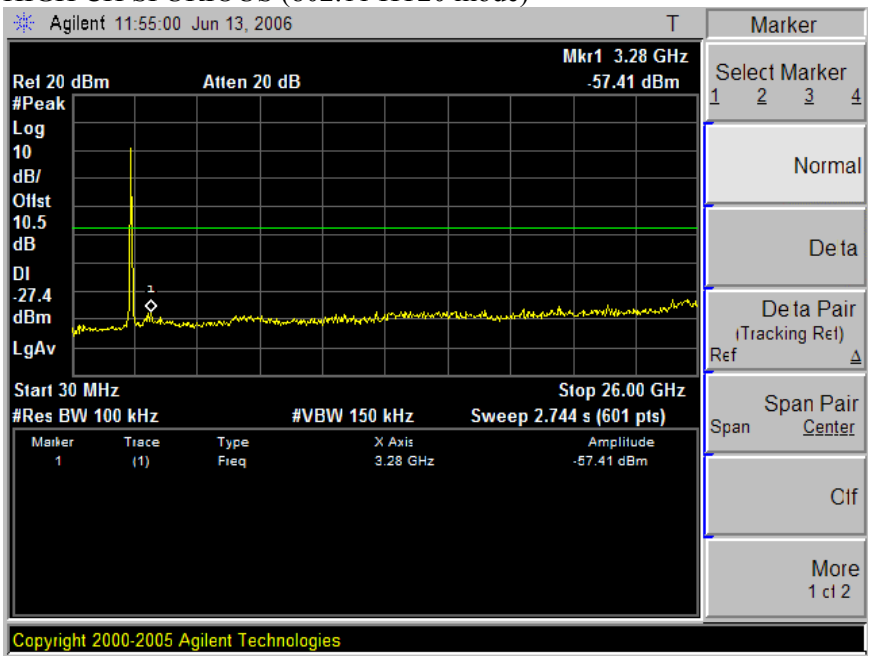


SPURIOUS EMISSIONS, HIGH CHANNEL (802.11 HT20 MODE)

HIGH CH BANDEDGE (802.11 HT20 mode)



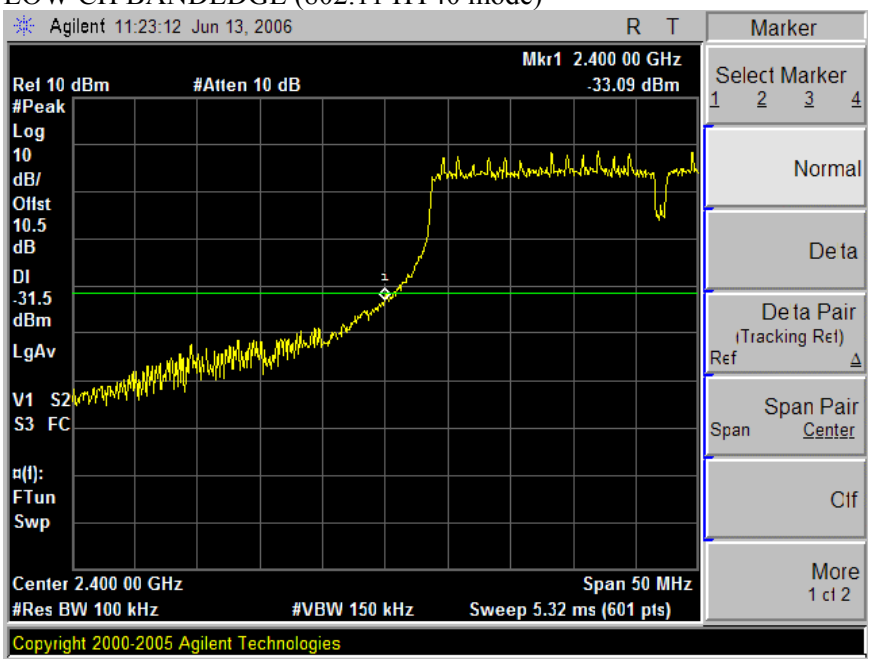
HIGH CH SPURIOUS (802.11 HT20 mode)



SPURIOUS EMISSIONS, LOW CHANNEL (802.11 HT40 MODE)

CH 2422MHz

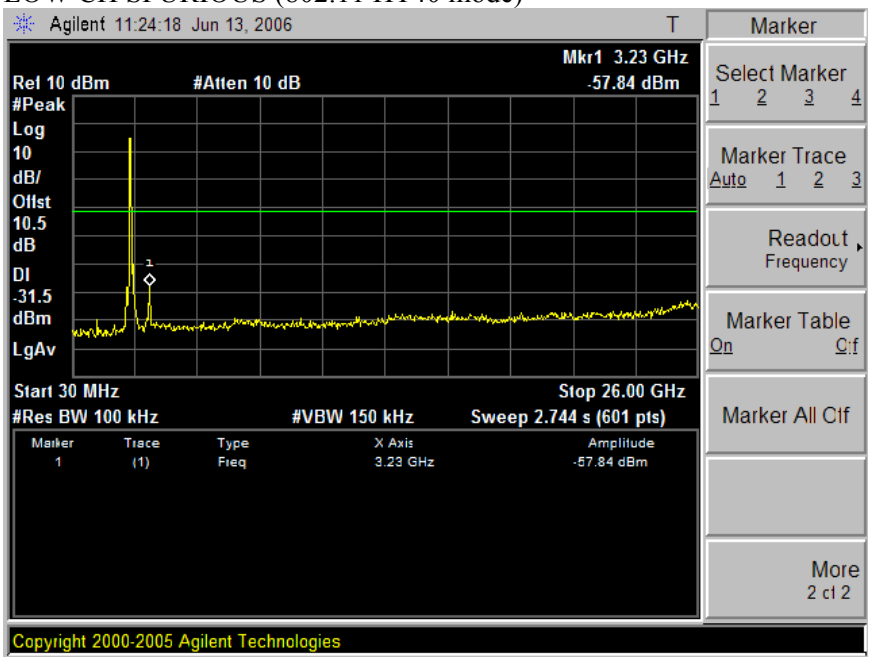
LOW CH BANDEDGE (802.11 HT40 mode)



SPURIOUS EMISSIONS, LOW CHANNEL (802.11 HT40 MODE)

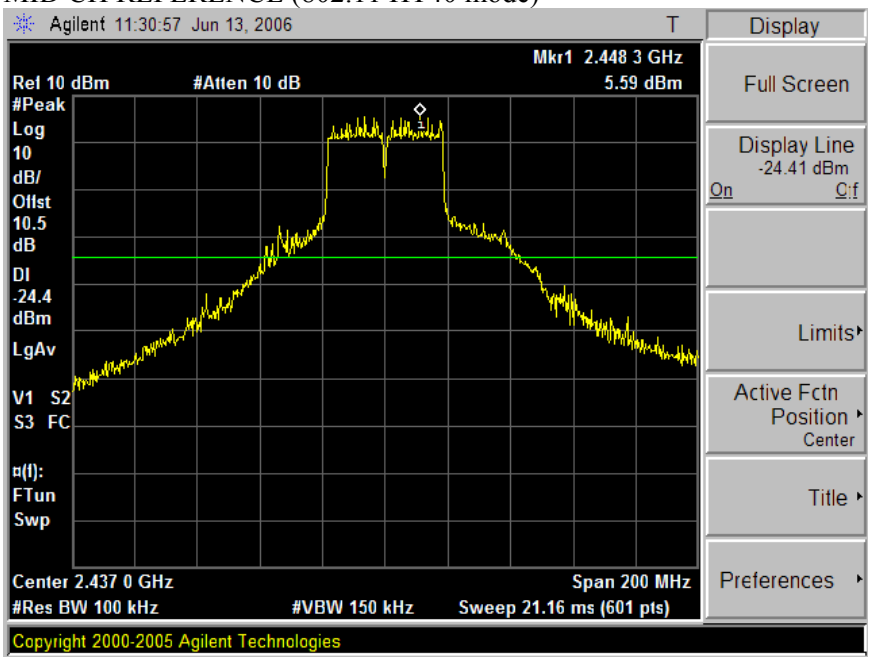
CH. 2422 MHz

LOW CH SPURIOUS (802.11 HT40 mode)

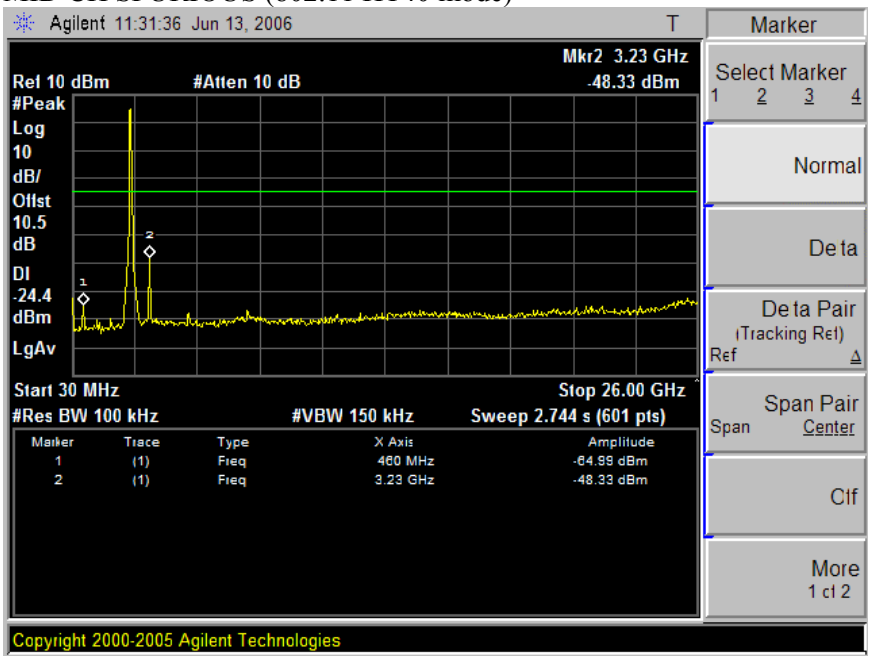


SPURIOUS EMISSIONS, MID CHANNEL (802.11 HT40 MODE)

MID CH REFERENCE (802.11 HT40 mode)



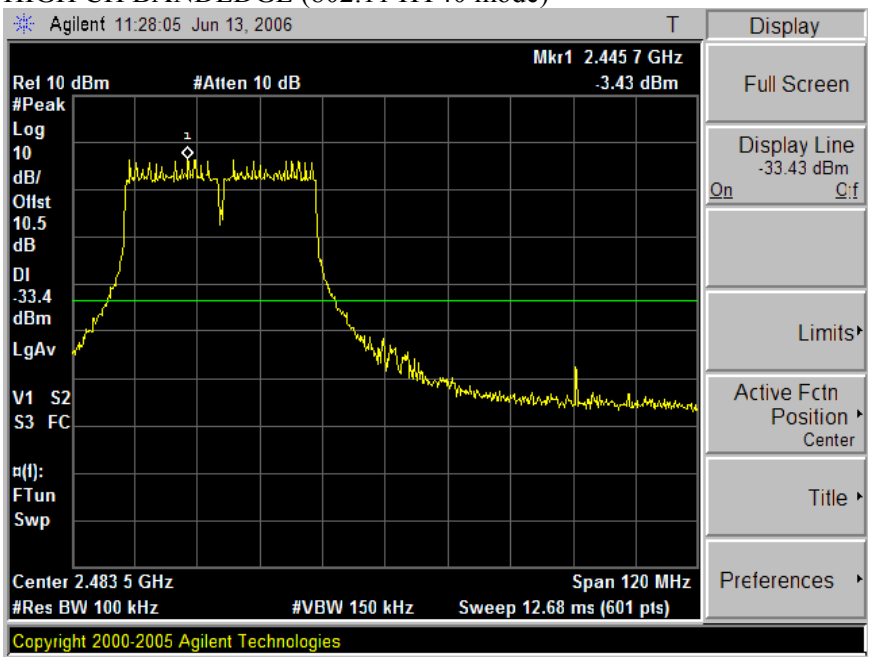
MID CH SPURIOUS (802.11 HT40 mode)



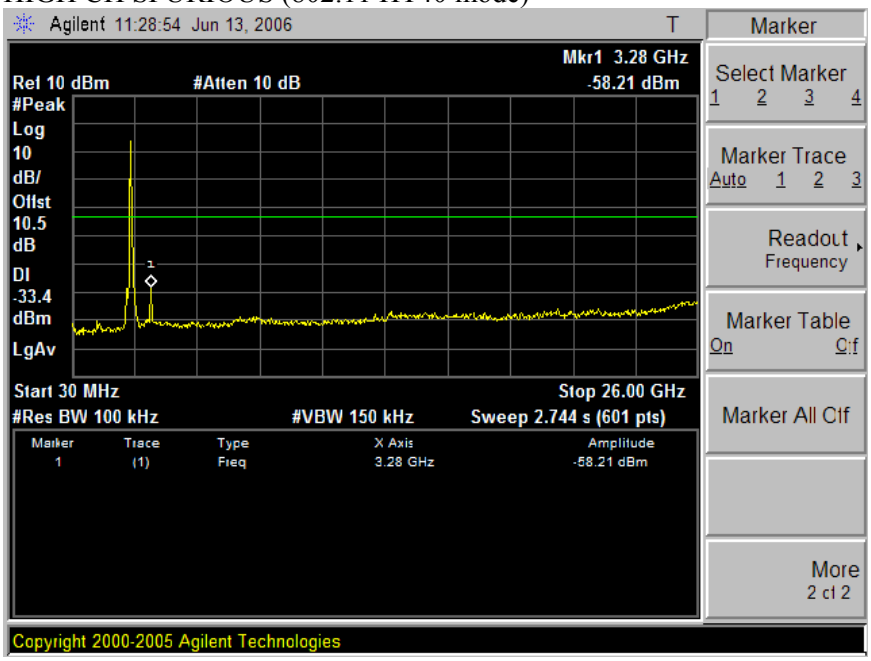
SPURIOUS EMISSIONS, HIGH CHANNEL (802.11 HT40 MODE)

CH 2452MHz

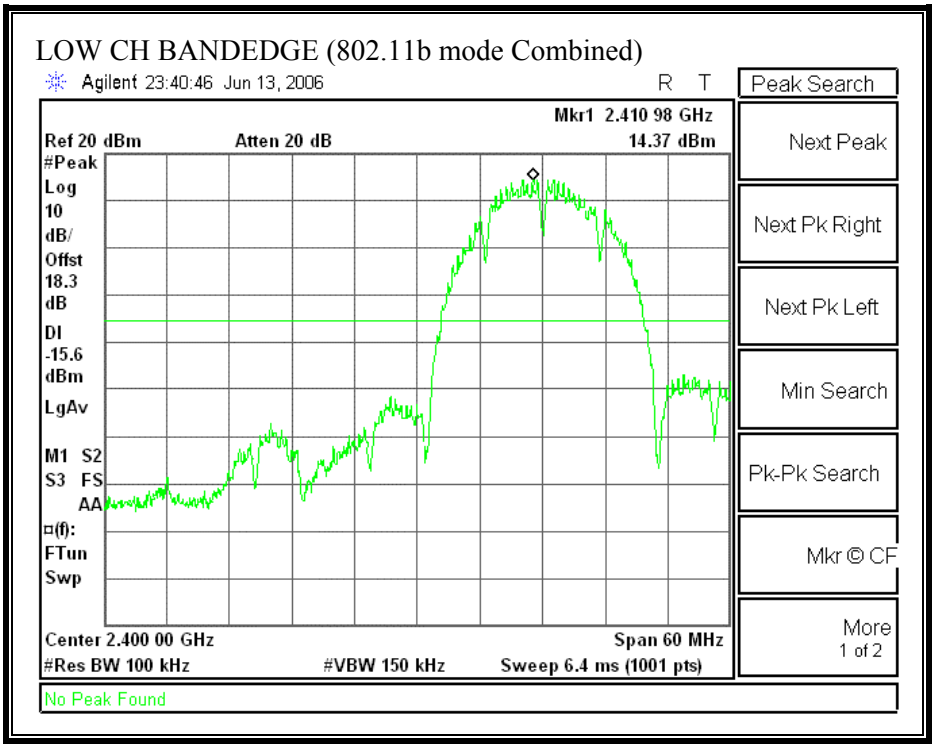
HIGH CH BANDEDGE (802.11 HT40 mode)



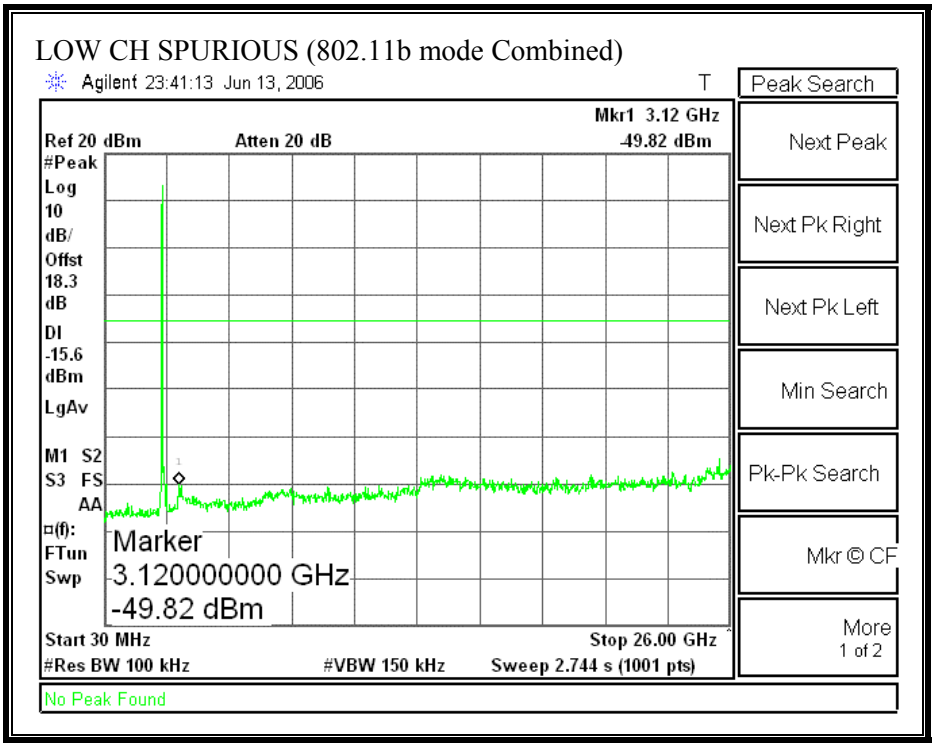
HIGH CH SPURIOUS (802.11 HT40 mode)



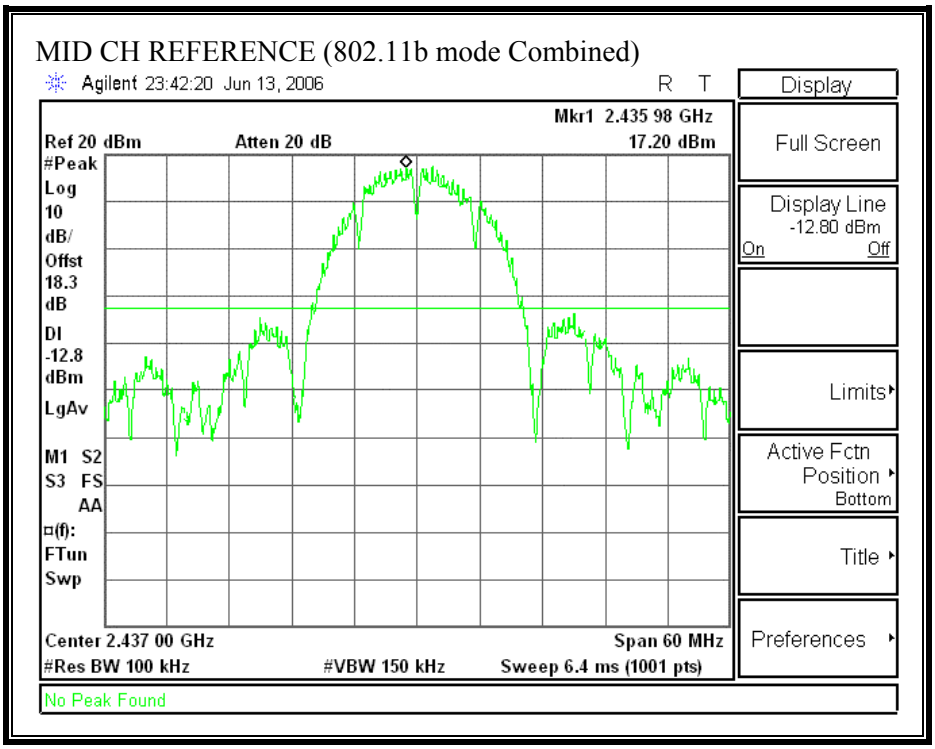
COMBINED SPURIOUS EMISSIONS (802.11b MODE)



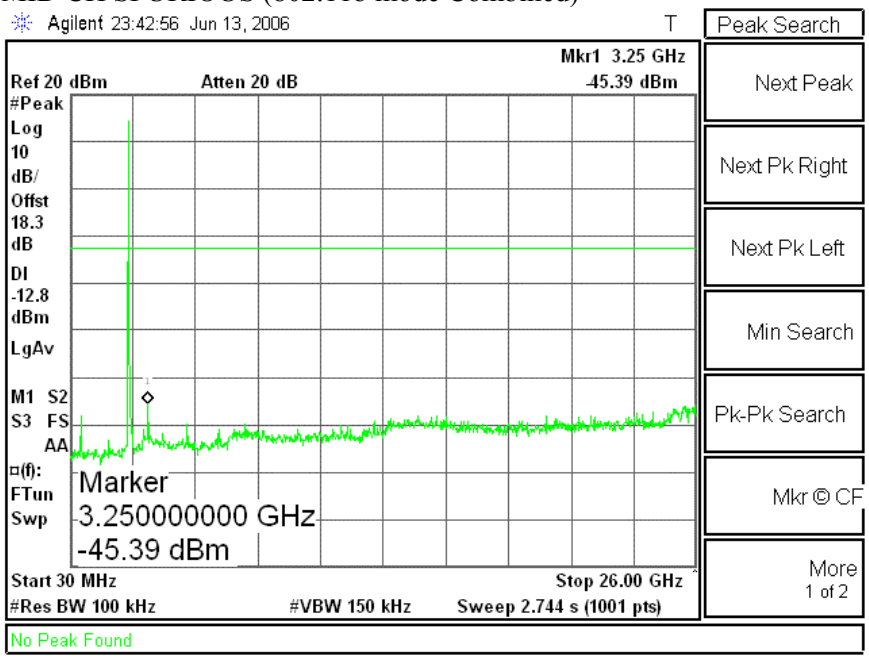
LOW CH SPURIOUS (802.11b mode Combined)



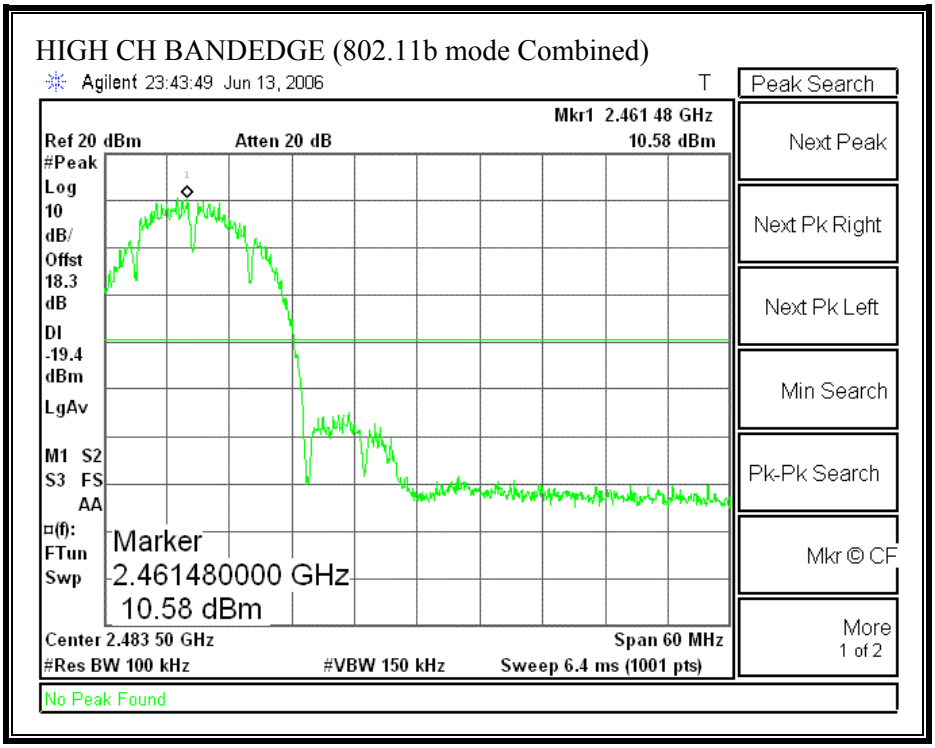
MID CH REFERENCE (802.11b mode Combined)



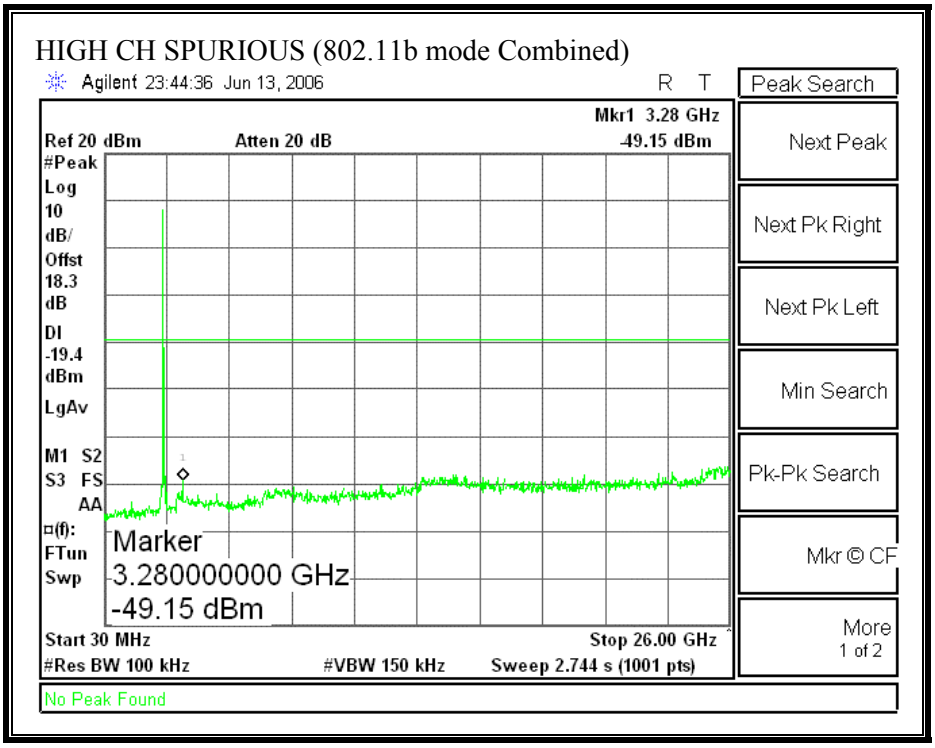
MID CH SPURIOUS (802.11b mode Combined)



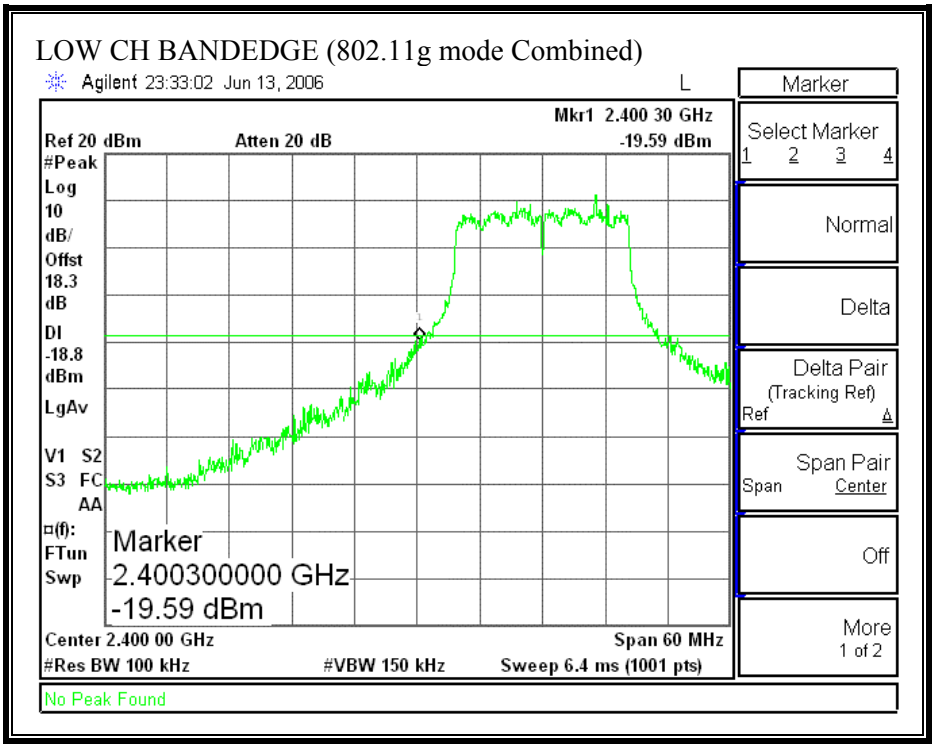
HIGH CH BANDEDGE (802.11b mode Combined)



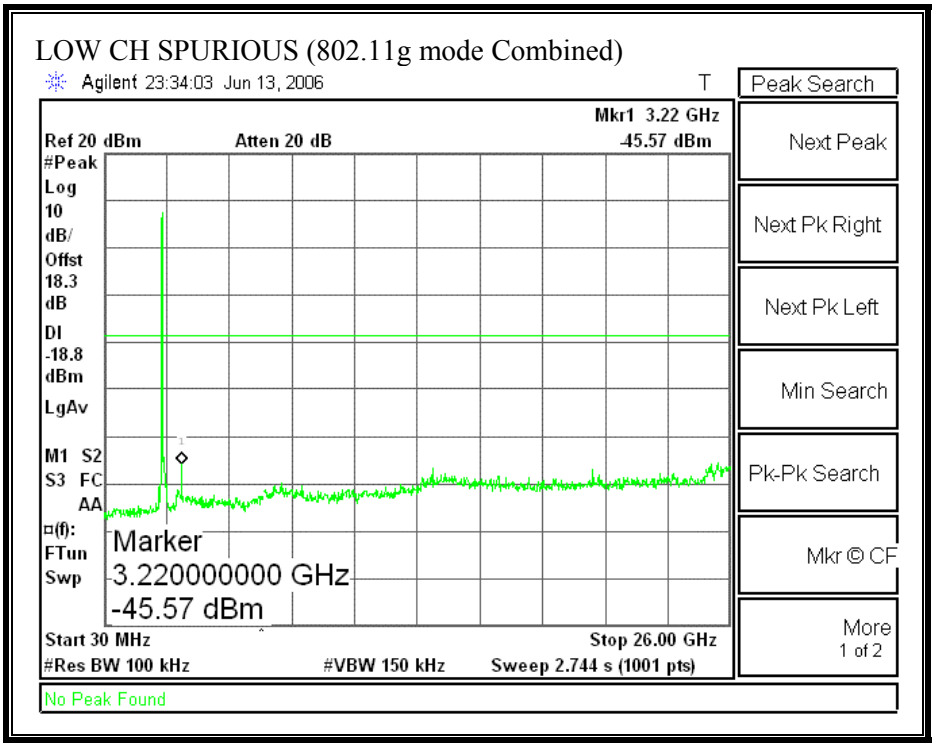
HIGH CH SPURIOUS (802.11b mode Combined)



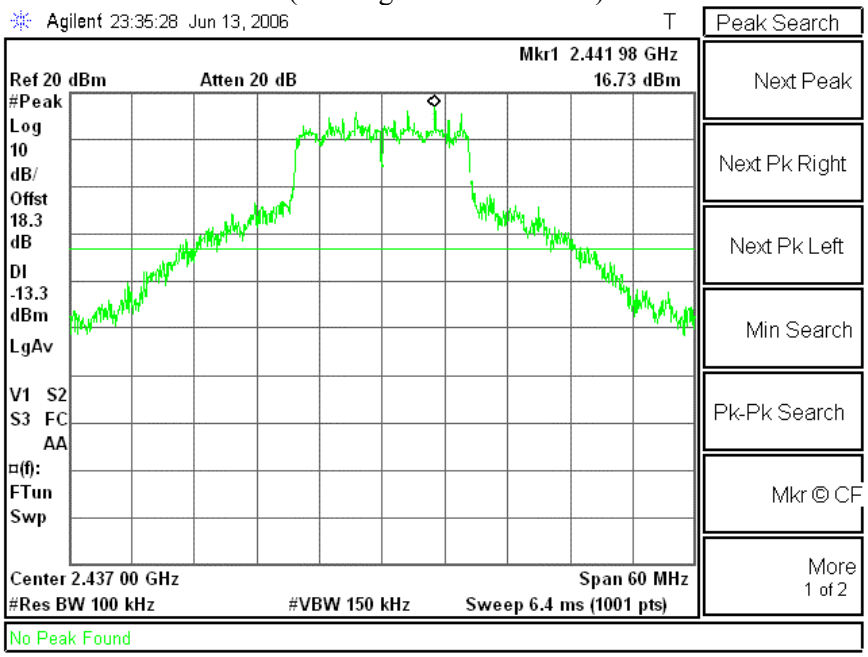
COMBINED SPURIOUS EMISSIONS (802.11g MODE)



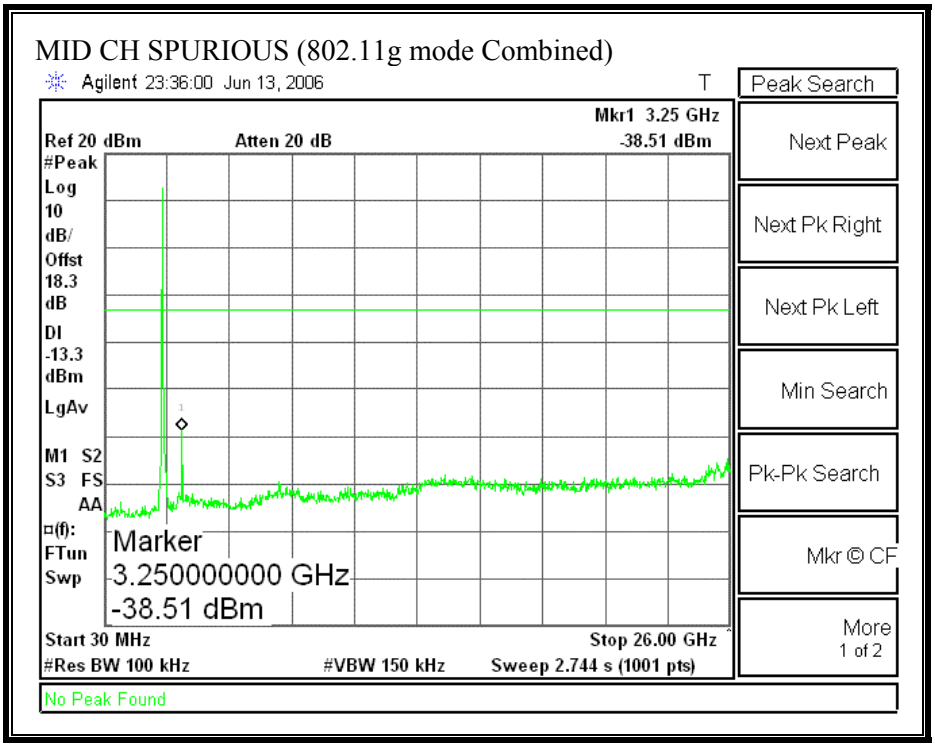
LOW CH SPURIOUS (802.11g mode Combined)



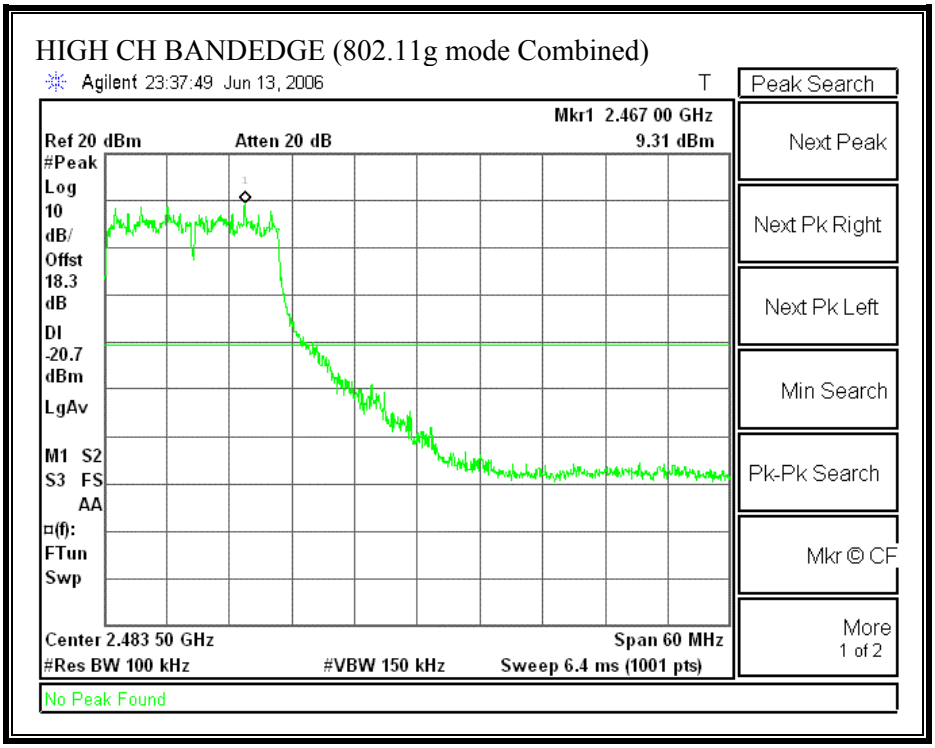
MID CH REFERENCE (802.11g mode Combined)



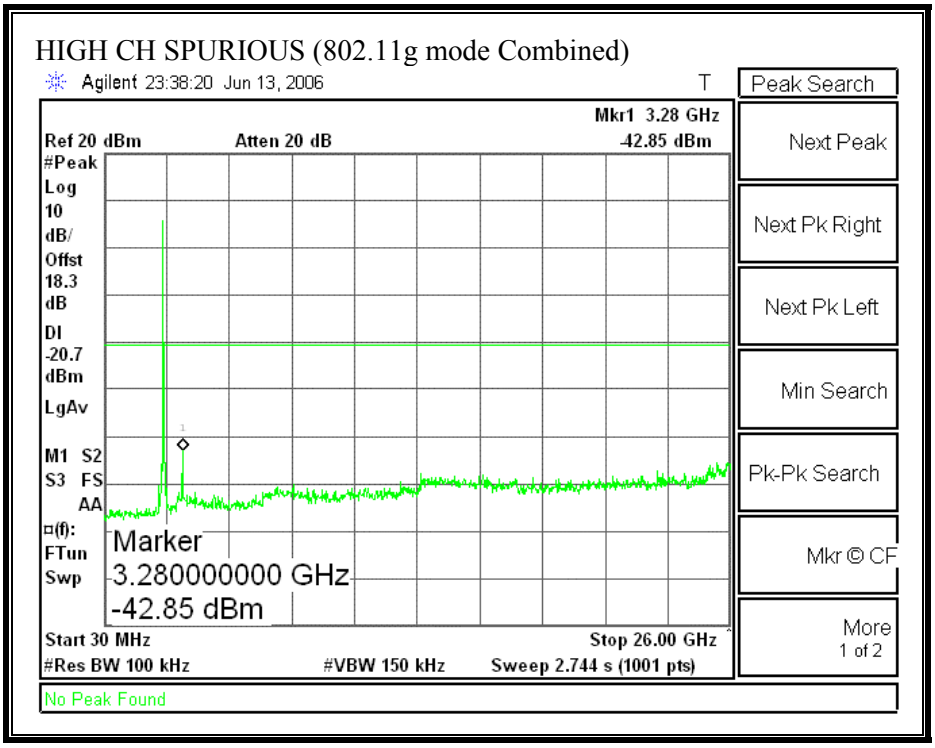
MID CH SPURIOUS (802.11g mode Combined)



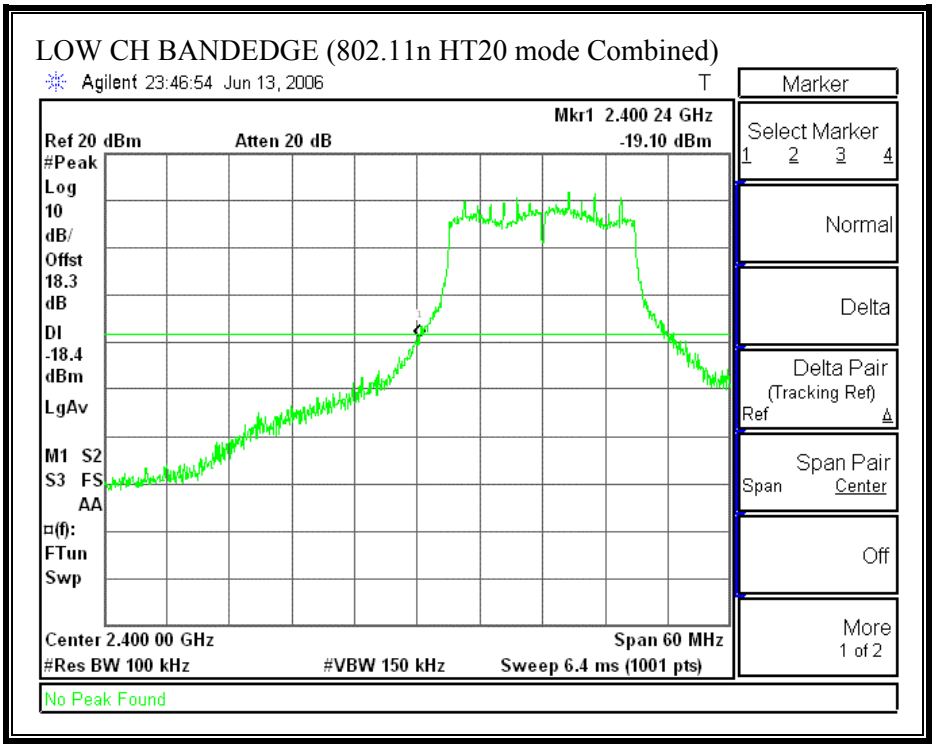
HIGH CH BANDEDGE (802.11g mode Combined)



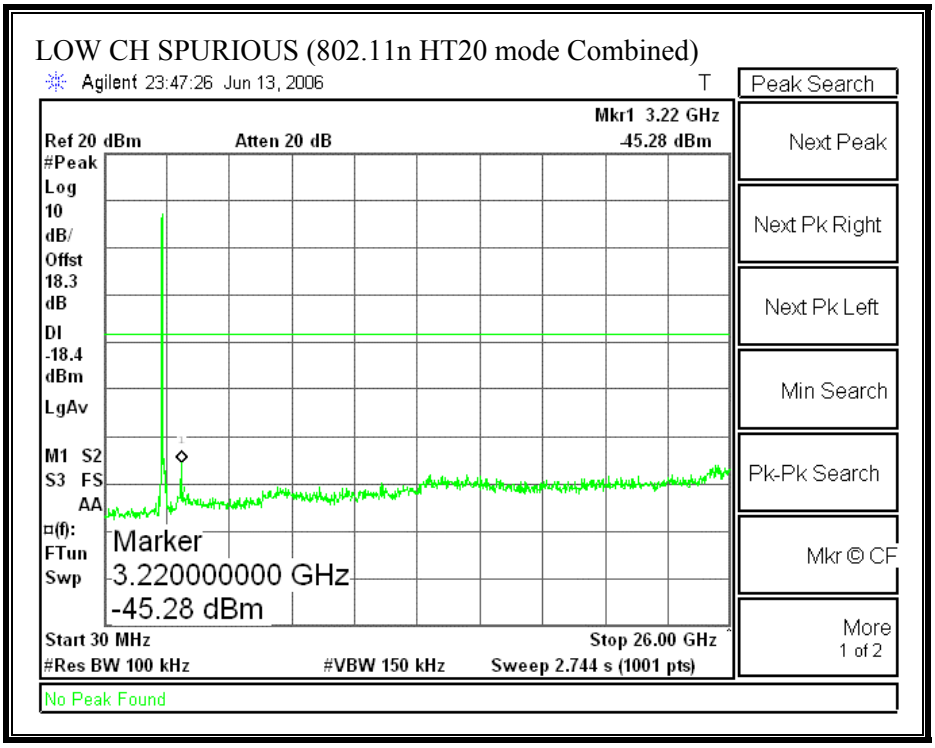
HIGH CH SPURIOUS (802.11g mode Combined)



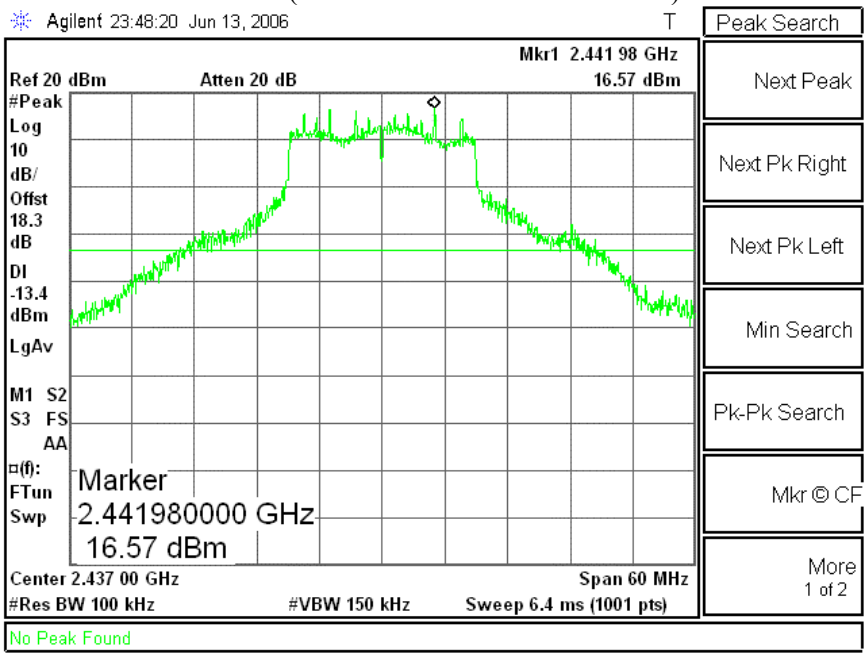
COMBINED SPURIOUS EMISSIONS (802.11n HT20 MODE)



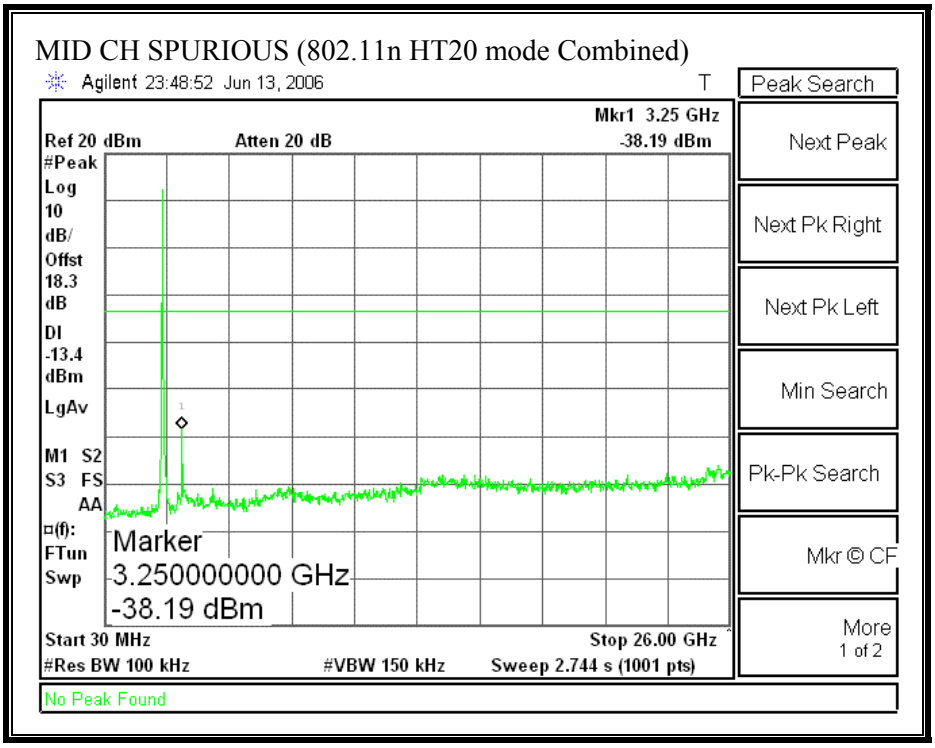
LOW CH SPURIOUS (802.11n HT20 mode Combined)



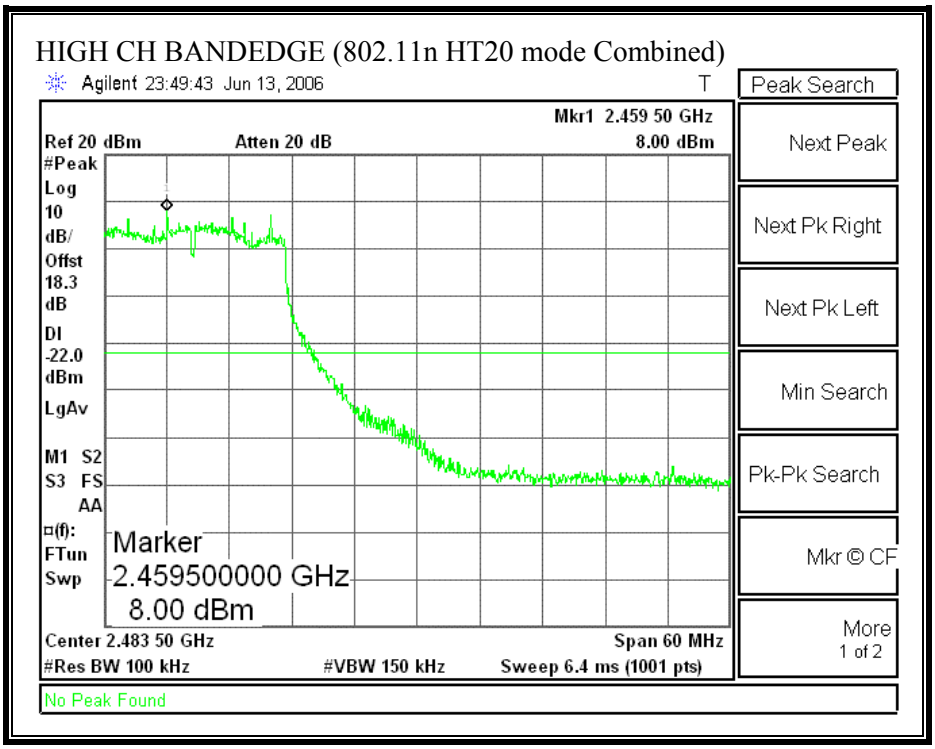
MID CH REFERENCE (802.11n HT20 mode Combined)



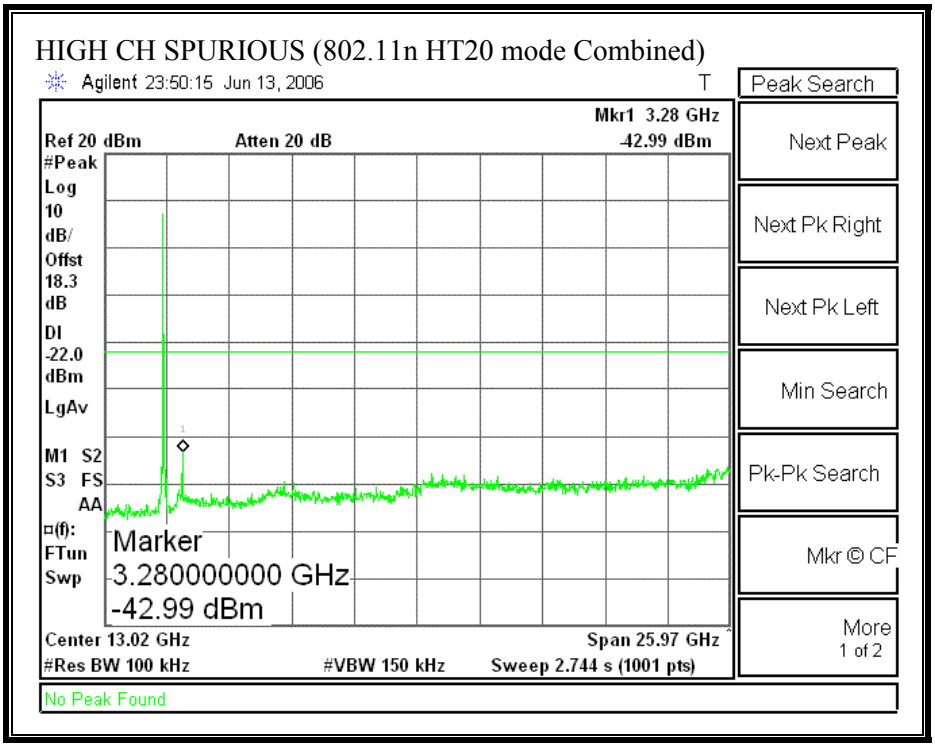
MID CH SPURIOUS (802.11n HT20 mode Combined)



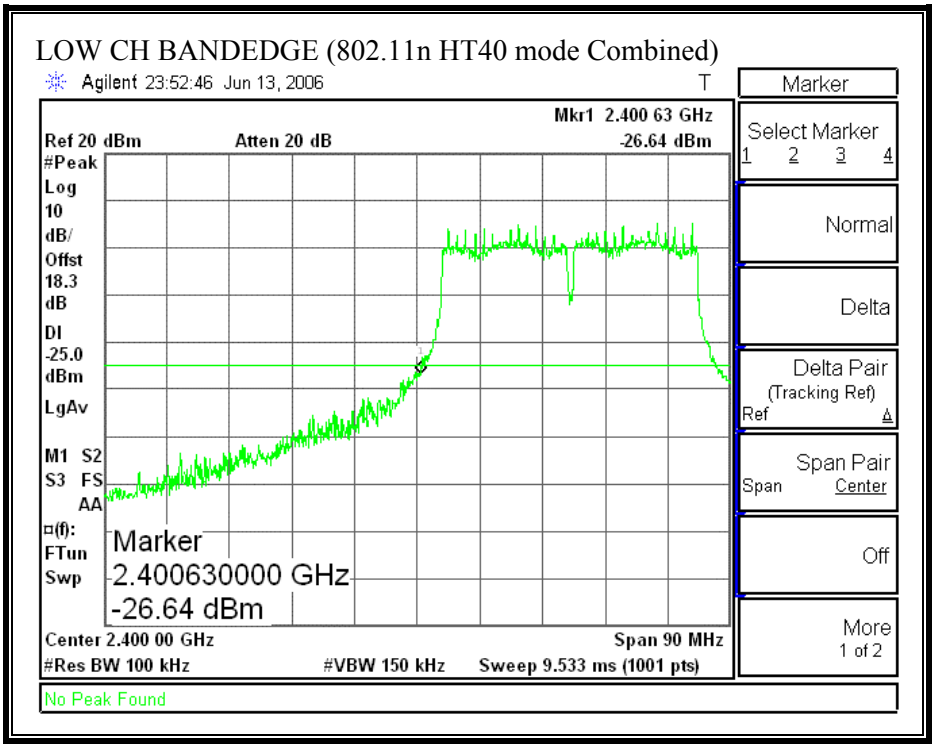
HIGH CH BANDEDGE (802.11n HT20 mode Combined)



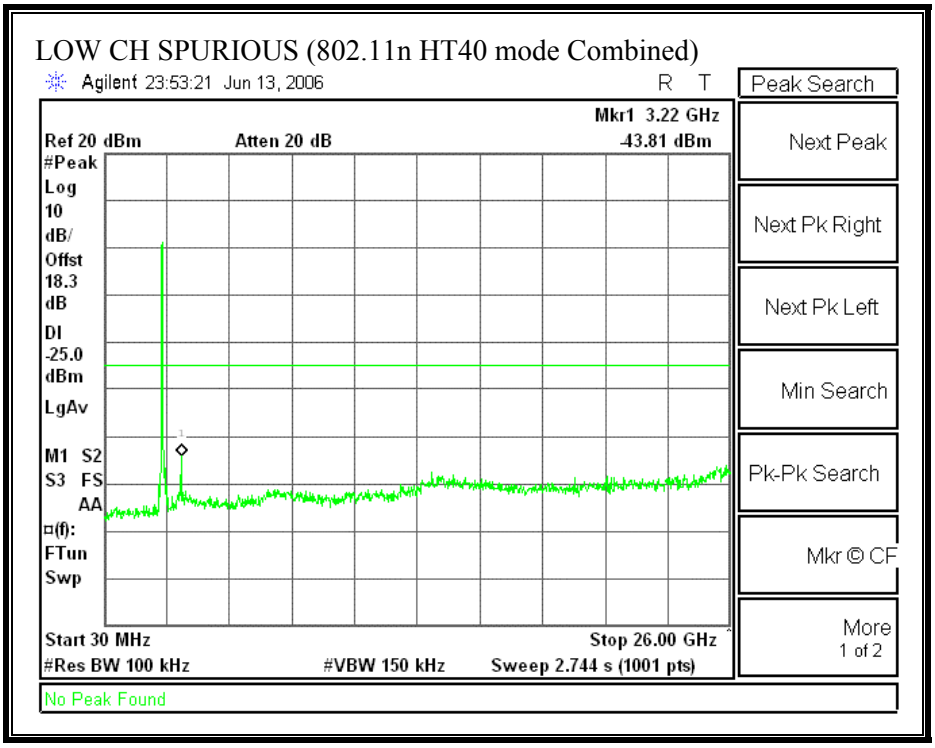
HIGH CH SPURIOUS (802.11n HT20 mode Combined)



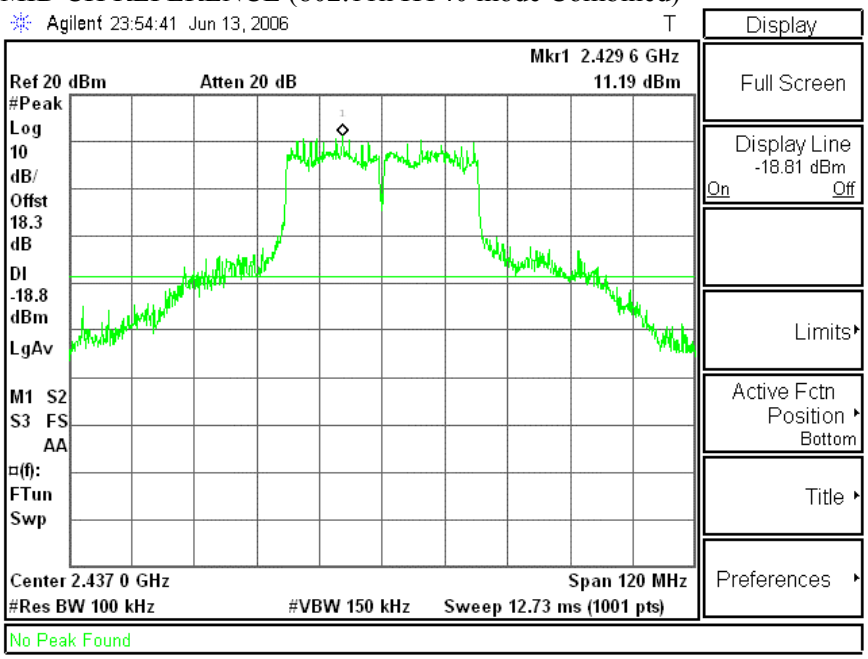
COMBINED SPURIOUS EMISSIONS (802.11 HT40 MODE)



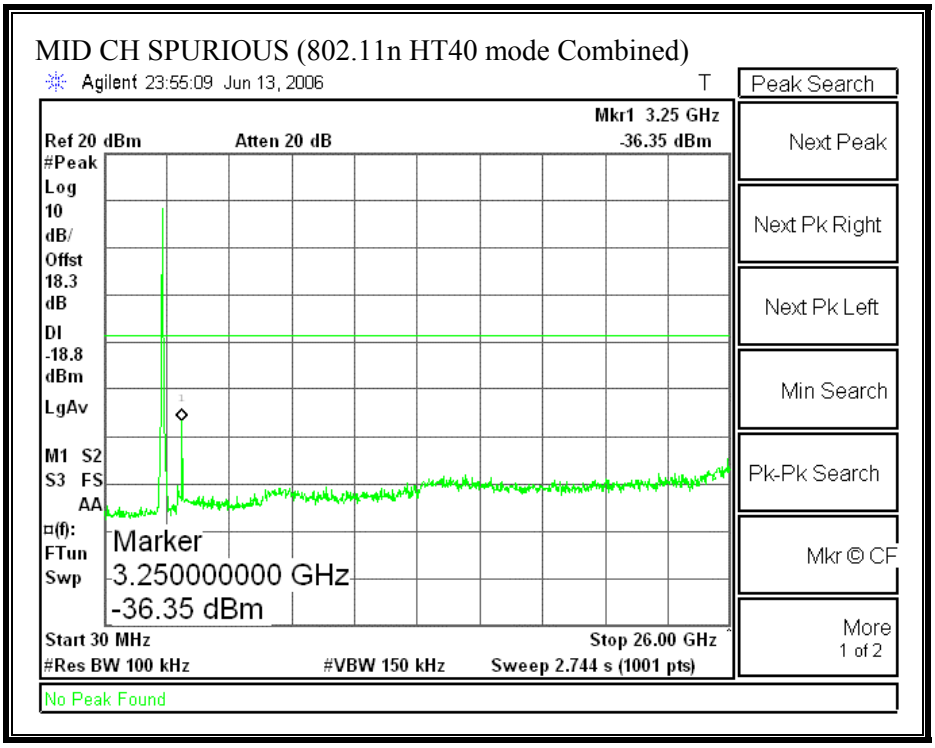
LOW CH SPURIOUS (802.11n HT40 mode Combined)



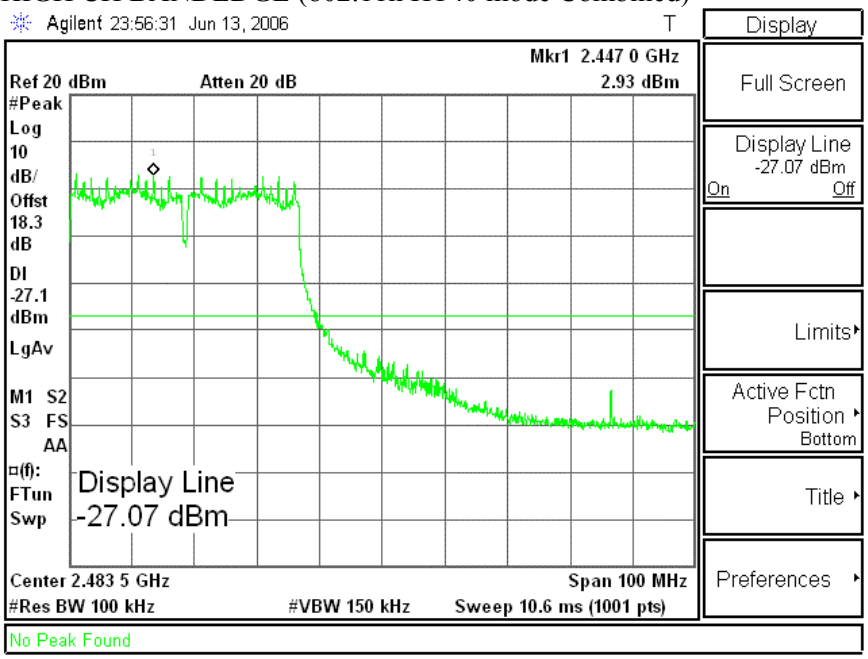
MID CH REFERENCE (802.11n HT40 mode Combined)



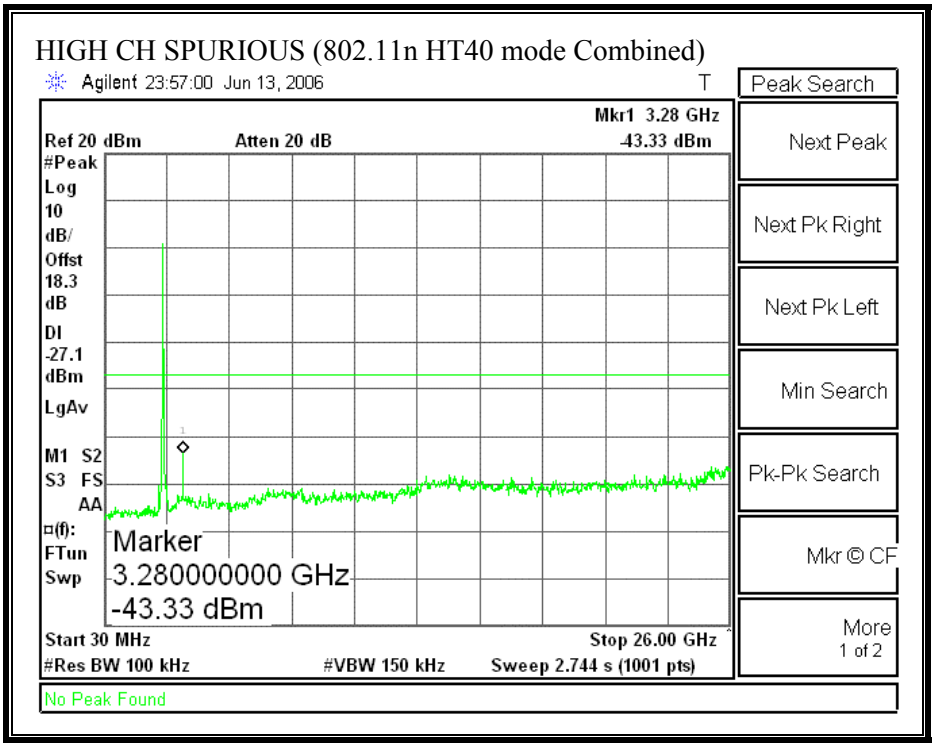
MID CH SPURIOUS (802.11n HT40 mode Combined)



HIGH CH BANDEDGE (802.11n HT40 mode Combined)



HIGH CH SPURIOUS (802.11n HT40 mode Combined)



7.2. CHANNEL TESTS FOR THE 5725 TO 5850 MHz BAND

7.2.1. 6 dB BANDWIDTH

LIMIT

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

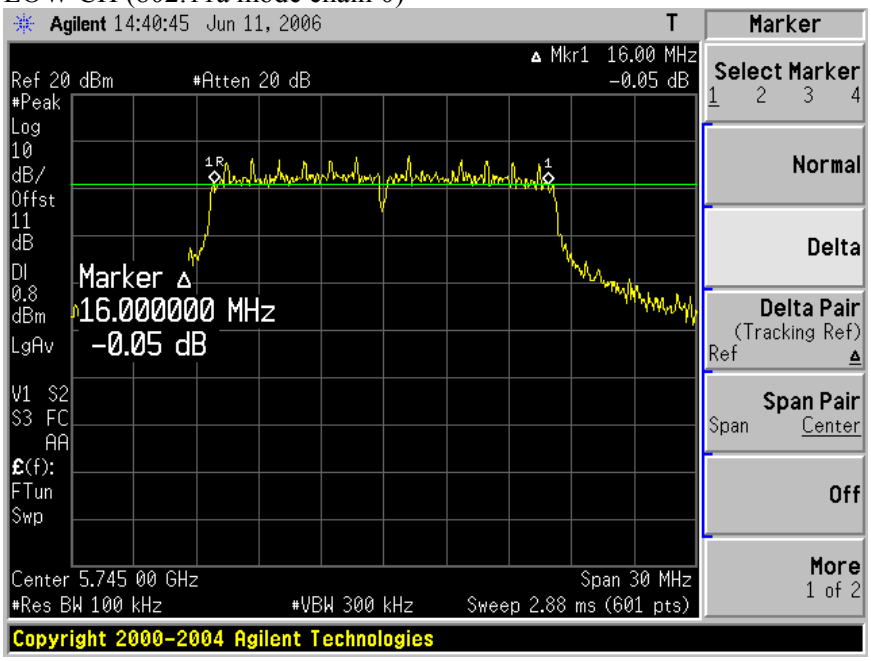
RESULTS

No non-compliance noted:

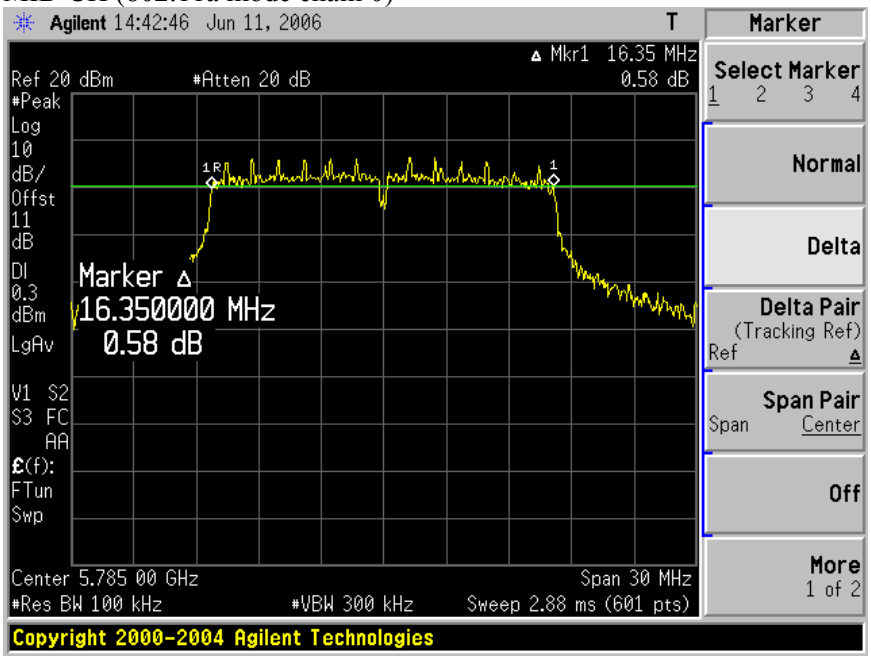
Mode Channel	Frequency (MHz)	6 dB BW Chain 0 (kHz)	6 dB BW Chain 2 (kHz)	Minimum Limit (kHz)	Minimum Margin (kHz)
802.11a Mode					
Low	5745	16000	16200	500	15500
Middle	5785	16350	16400	500	15850
High	5825	16100	16350	500	15600
802.11n HT20 Mode					
Low	5745	16650	16200	500	15700
Mid	5785	17450	16400	500	15900
High	5825	17450	16350	500	15850
802.11n HT40 Mode					
Low	5755	36200	36400	500	35700
Mid	5785	36300	36200	500	35700
High	5815	36200	36100	500	35600

(802.11a MODE CHAIN 0)

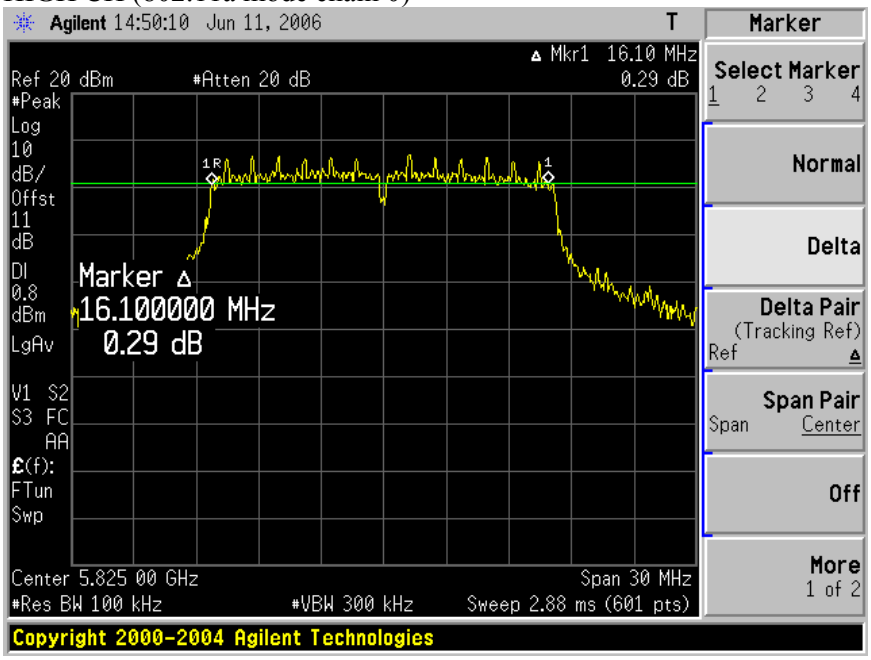
LOW CH (802.11a mode chain 0)



MID CH (802.11a mode chain 0)

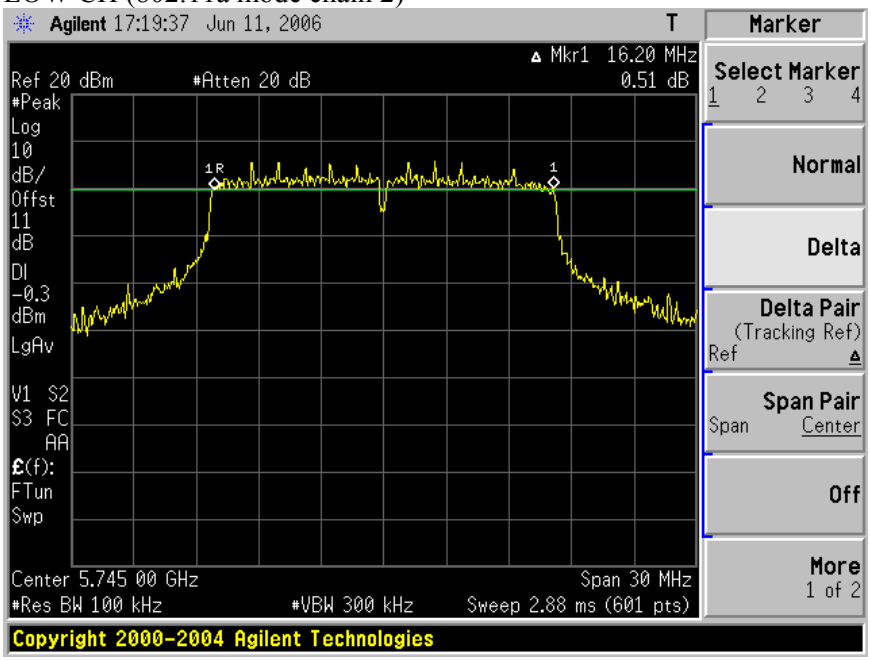


HIGH CH (802.11a mode chain 0)

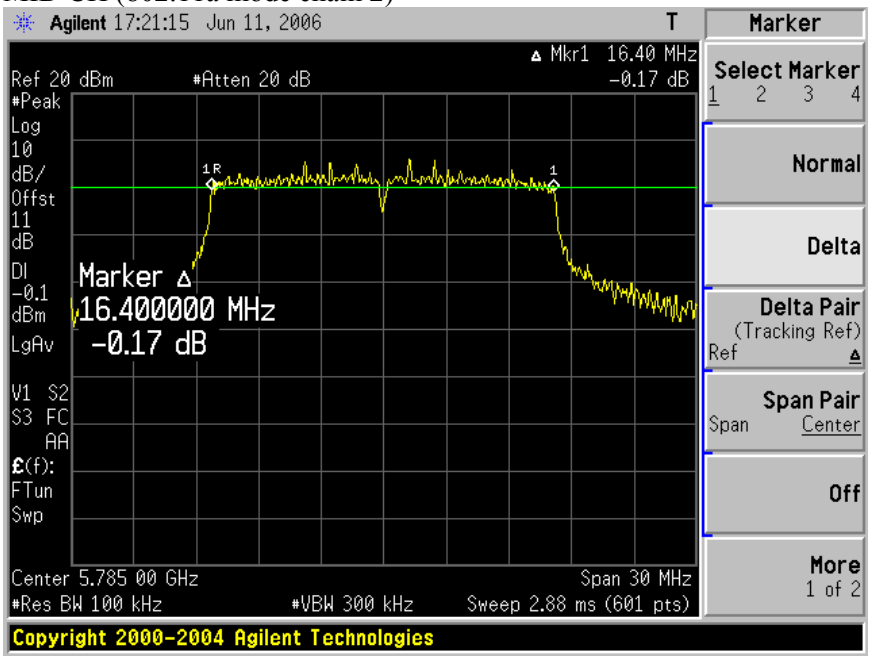


(802.11a MODE CHAIN 2)

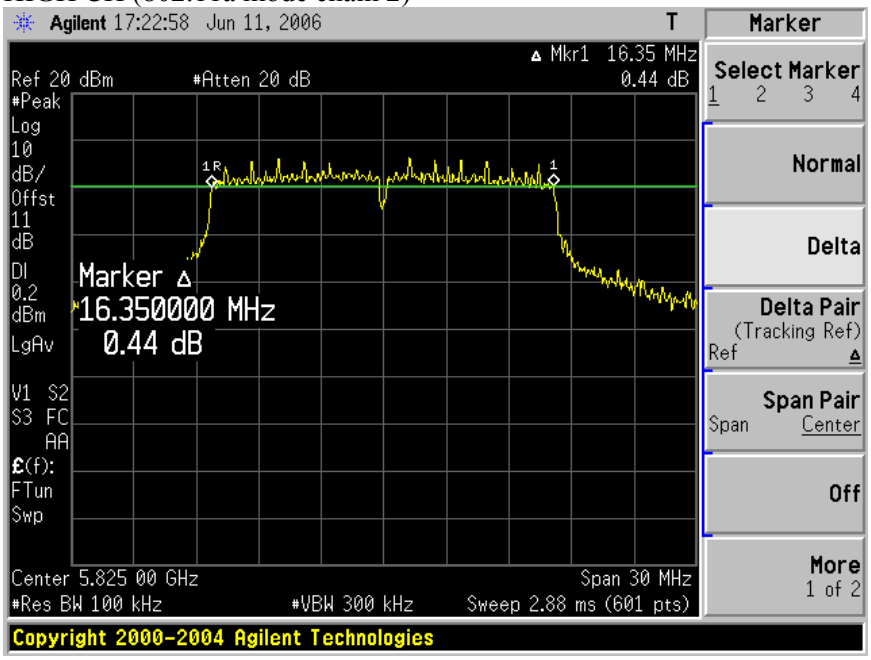
LOW CH (802.11a mode chain 2)



MID CH (802.11a mode chain 2)

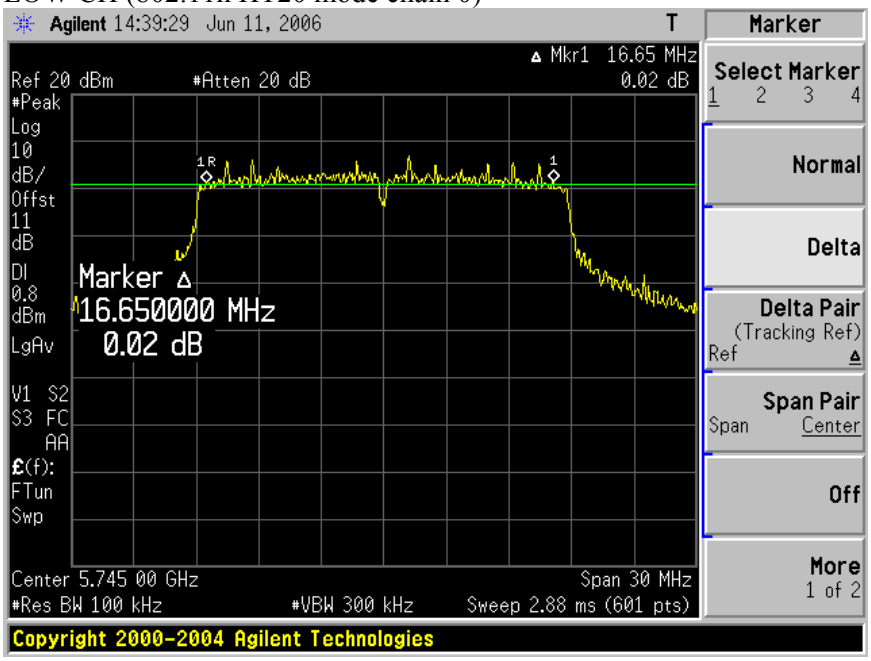


HIGH CH (802.11a mode chain 2)

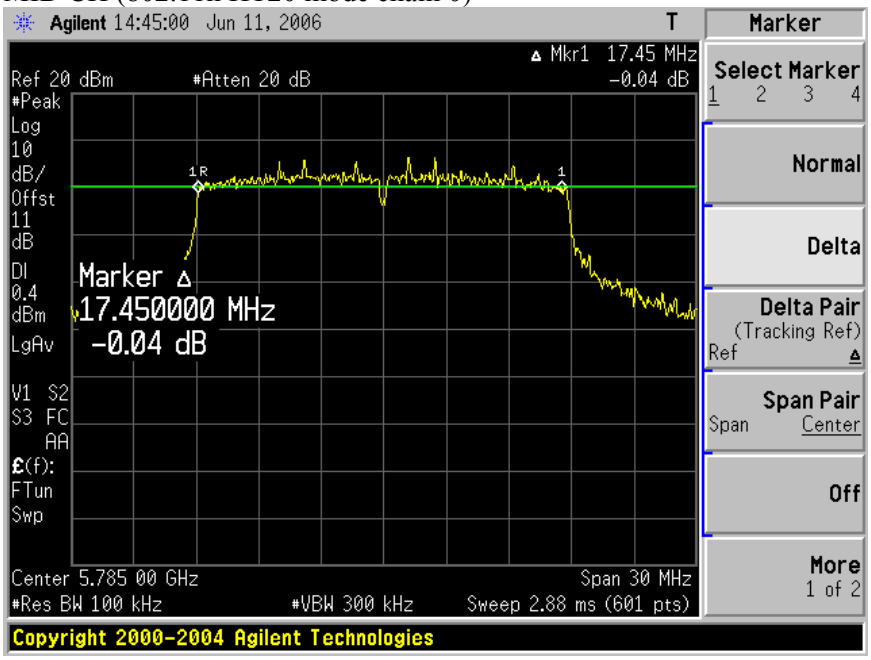


(802.11n HT20 MODE CHAIN 0)

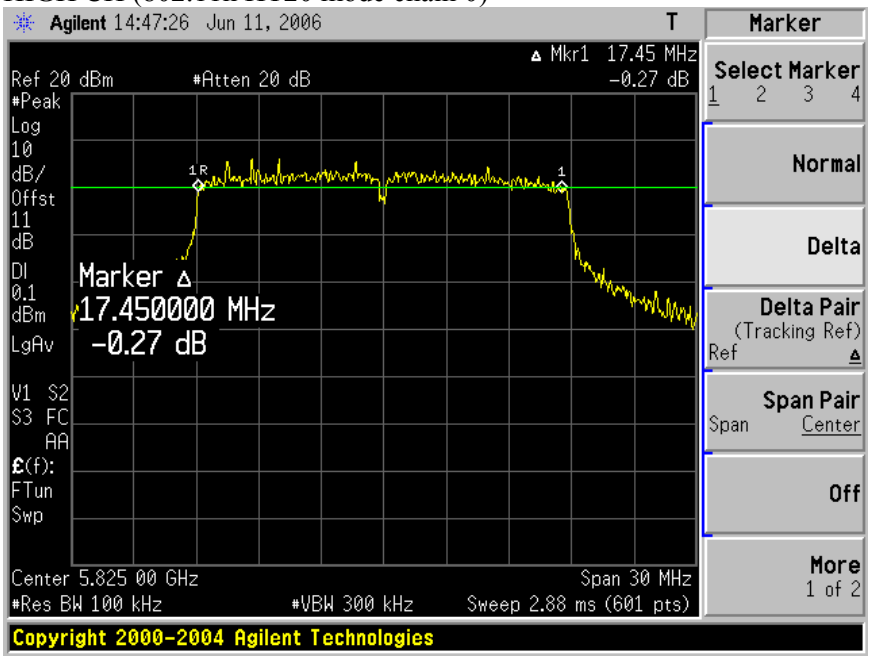
LOW CH (802.11n HT20 mode chain 0)



MID CH (802.11n HT20 mode chain 0)

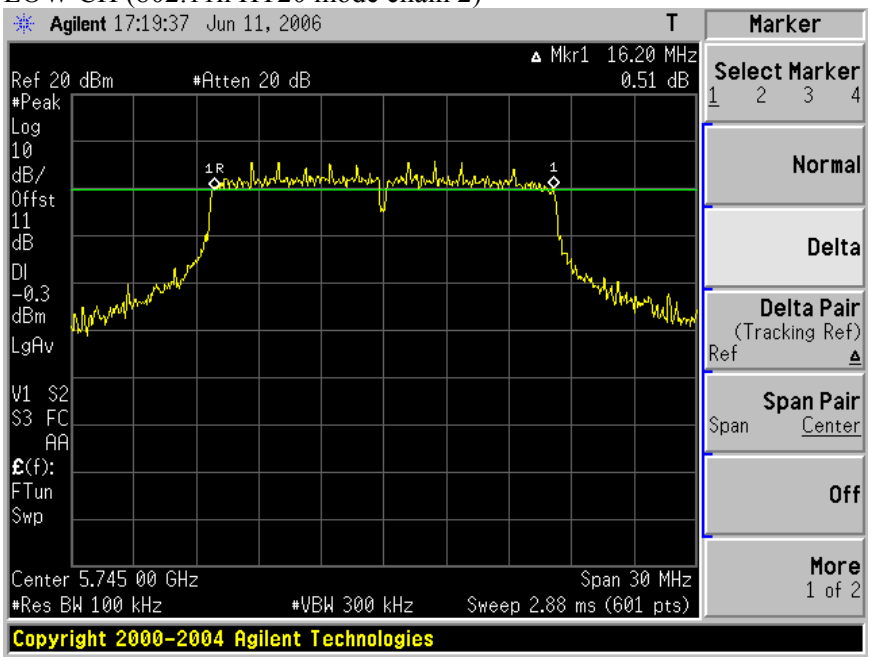


HIGH CH (802.11n HT20 mode chain 0)

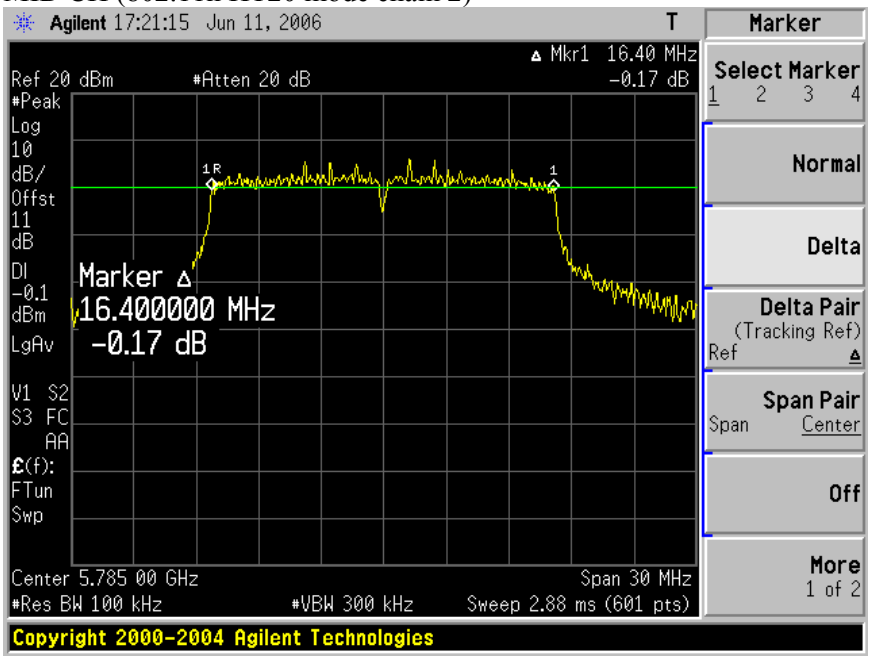


(802.11 HT20 MODE CHAIN 2)

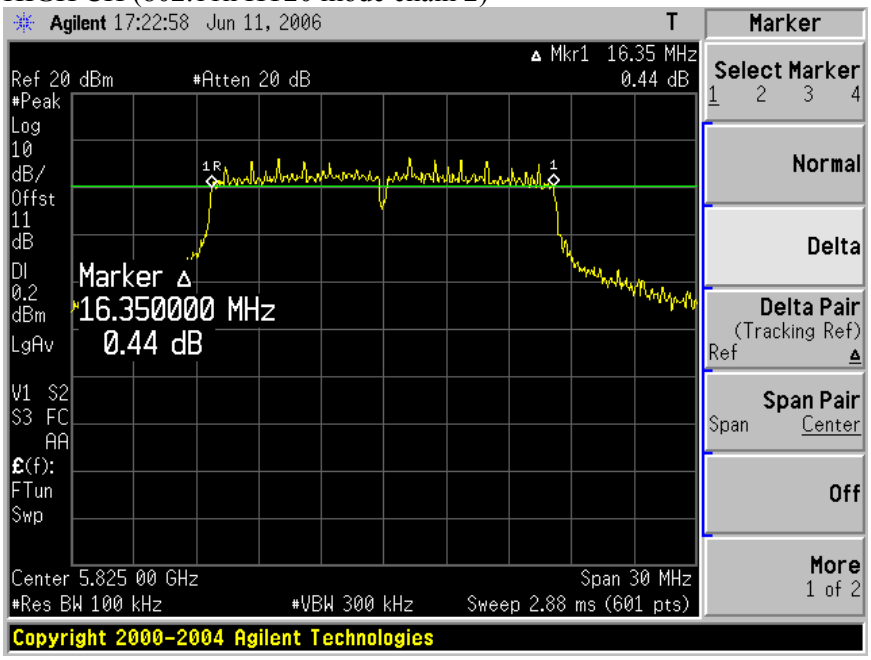
LOW CH (802.11n HT20 mode chain 2)



MID CH (802.11n HT20 mode chain 2)

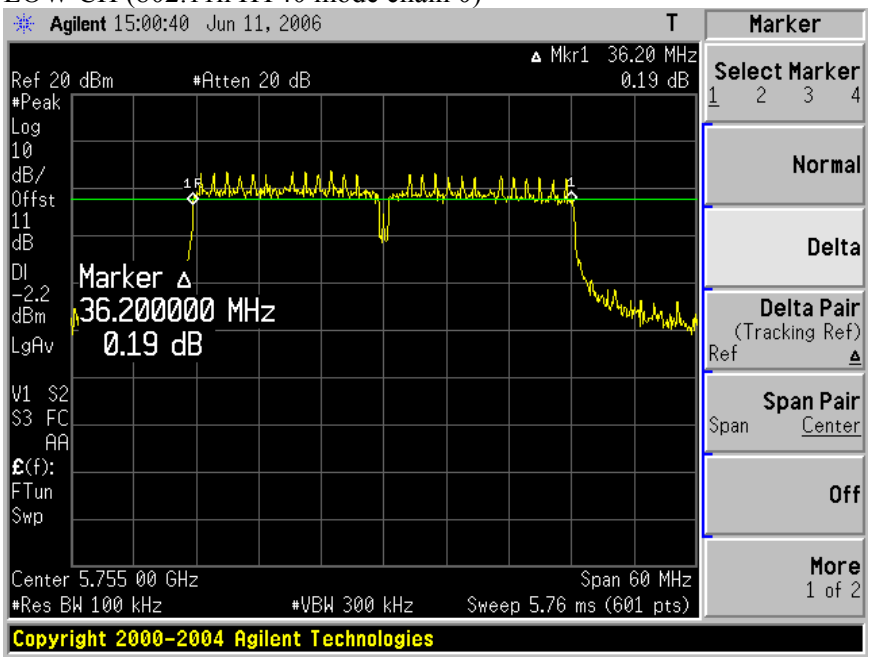


HIGH CH (802.11n HT20 mode chain 2)

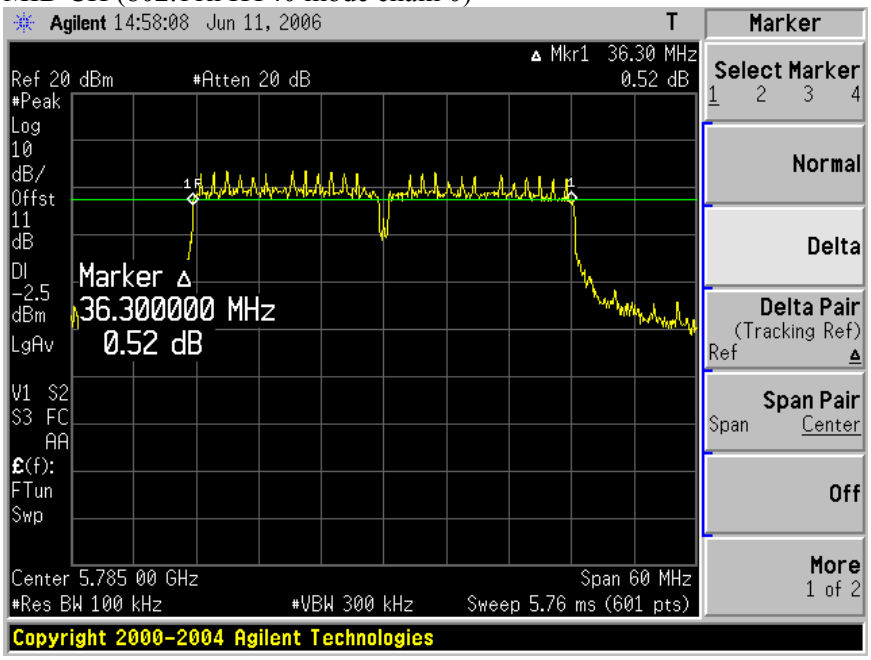


(802.11 HT40 MODE CHAIN 0)

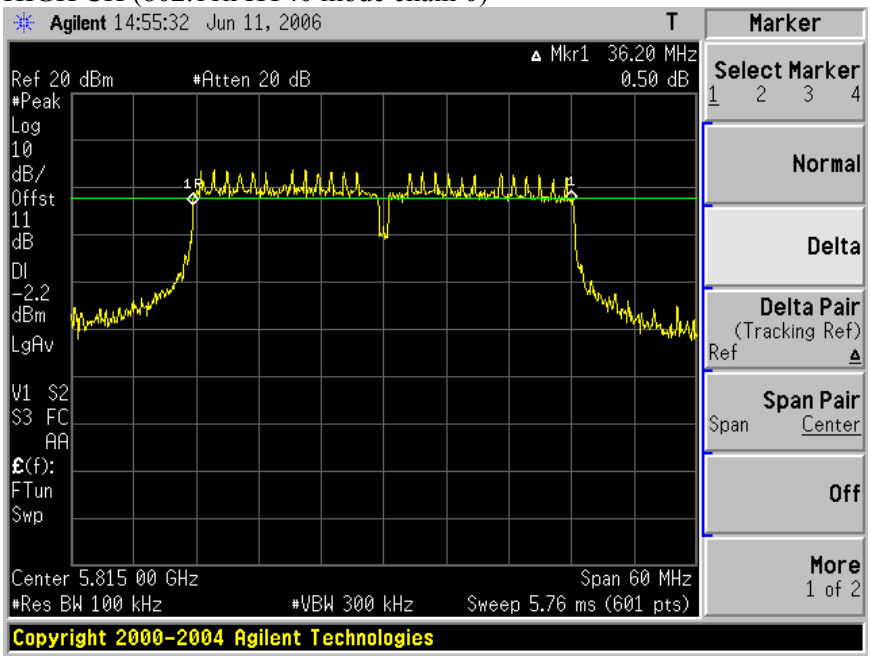
LOW CH (802.11n HT40 mode chain 0)



MID CH (802.11n HT40 mode chain 0)

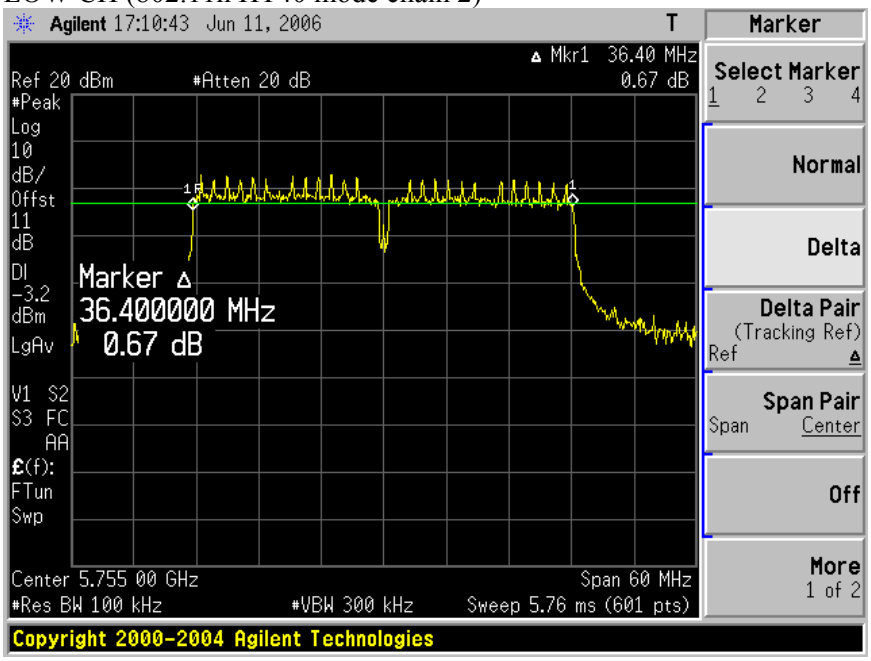


HIGH CH (802.11n HT40 mode chain 0)

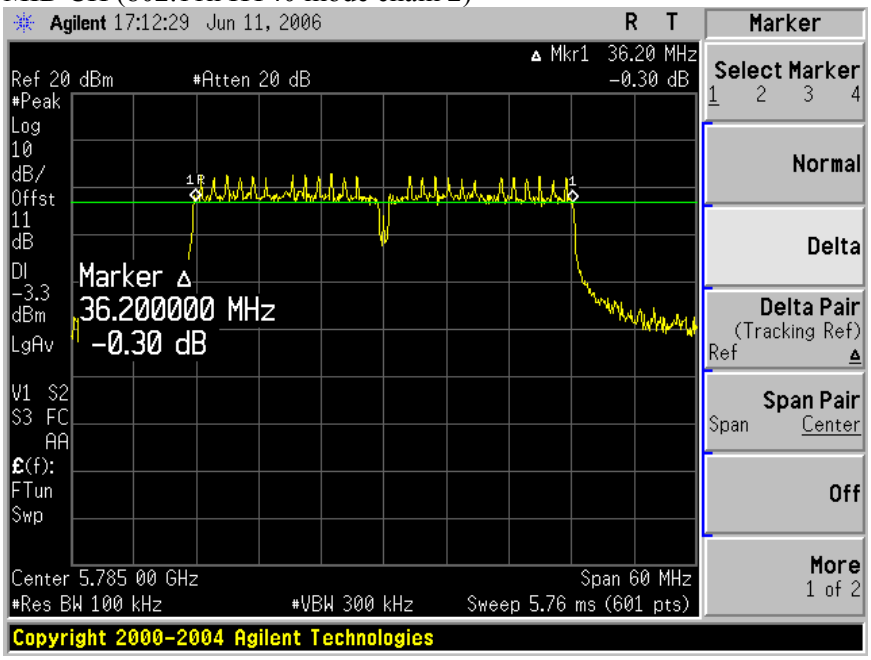


(802.11 HT40 MODE CHAIN 2)

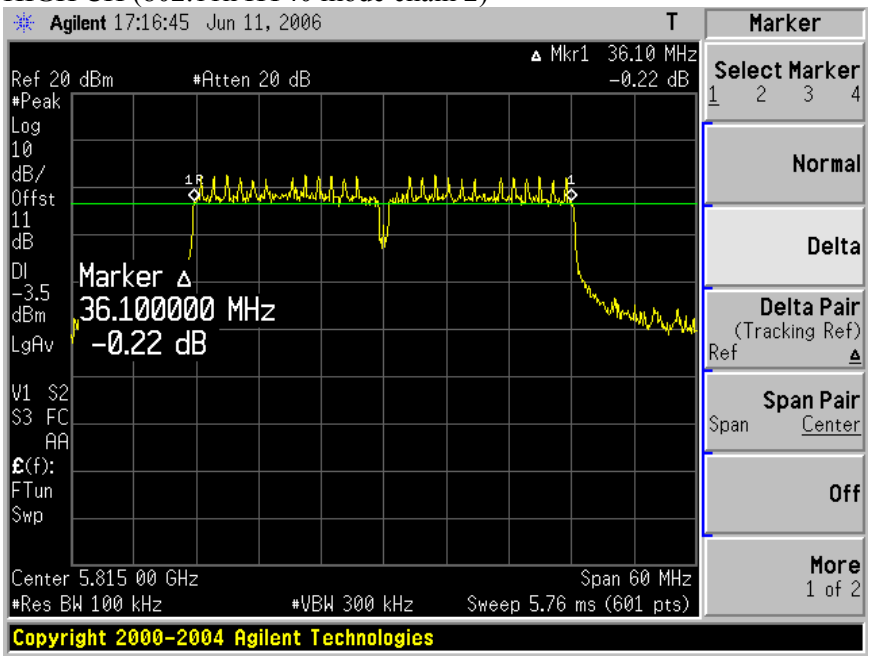
LOW CH (802.11n HT40 mode chain 2)



MID CH (802.11n HT40 mode chain 2)



HIGH CH (802.11n HT40 mode chain 2)



7.2.2. 99% BANDWIDTH AND 26 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth and 26 dB bandwidth functions are utilized.

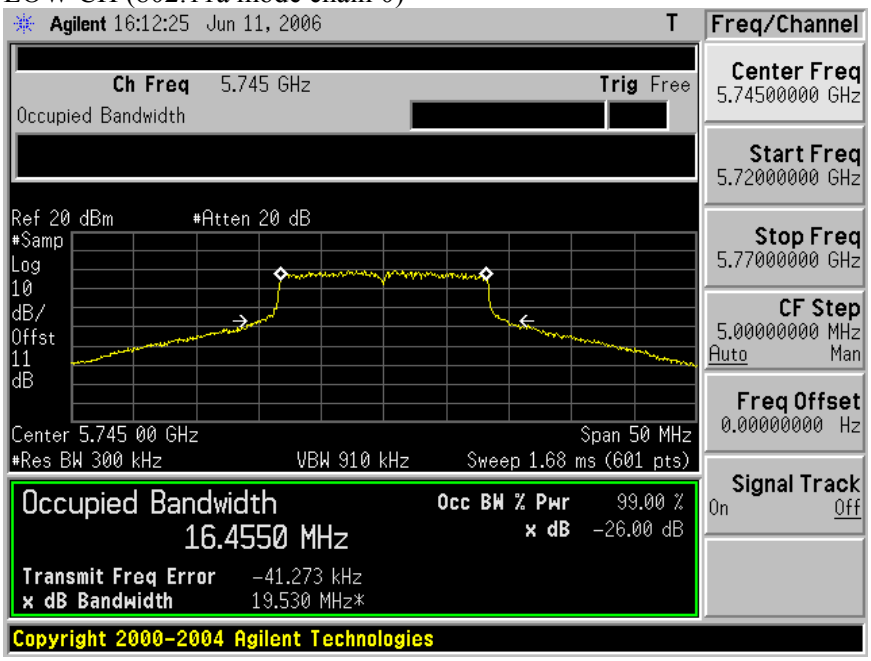
RESULTS

No non-compliance noted:

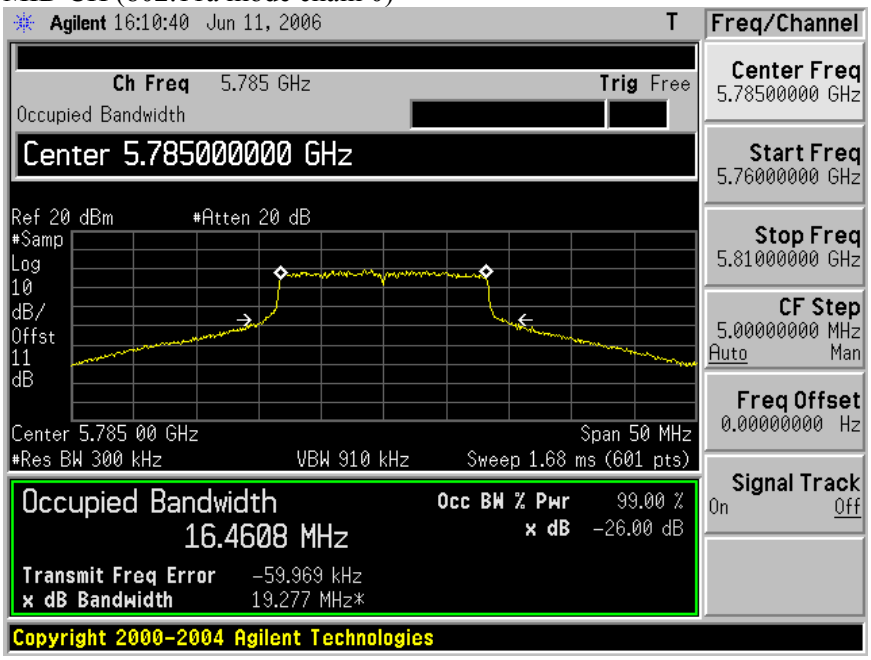
Mode Channel	Frequency (MHz)	99% BW Chain 0 (MHz)	99% BW Chain 2 (MHz)	26 dB BW Chain 0 (MHz)	26 dB BW Chain 2 (MHz)
802.11a Mode					
Low	5745	16.455	16.4815	19.53	18.9570
Middle	5785	16.4608	16.4909	19.277	19.4210
High	5825	16.4745	16.4668	19.683	19.8760
802.11n HT20 Mode					
Low	5745	17.5472	16.4815	19.902	18.9570
Mid	5785	16.4608	16.4909	19.277	19.4210
High	5825	16.4745	16.4668	19.683	19.8760
802.11n HT40 Mode					
Low	5755	36.4234	36.4013	40.731	38.2290
Mid	5785	36.3285	36.2539	39.066	38.0290
High	5815	36.2112	36.3184	38.449	39.1360

(802.11a MODE CHAIN 0)

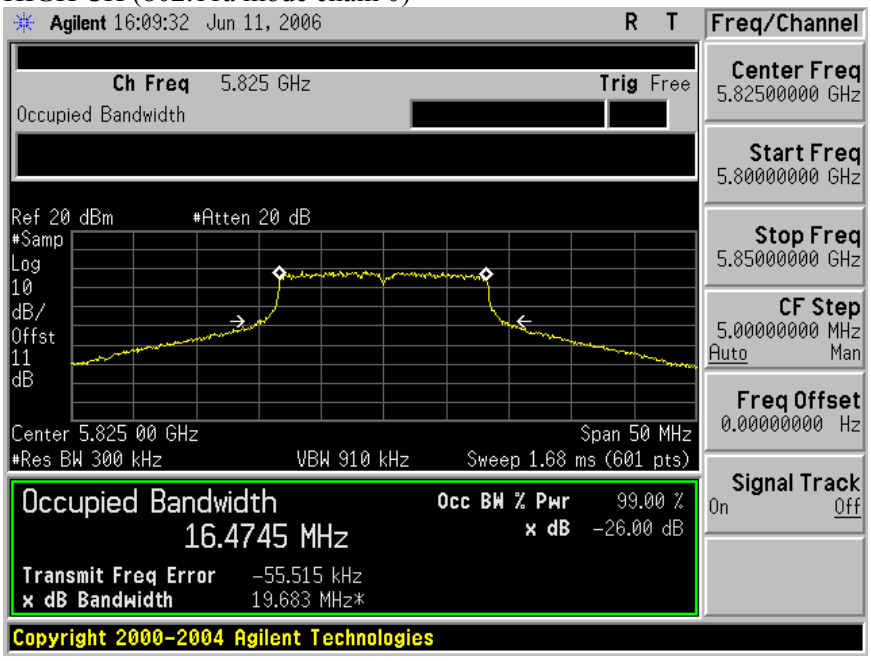
LOW CH (802.11a mode chain 0)



MID CH (802.11a mode chain 0)

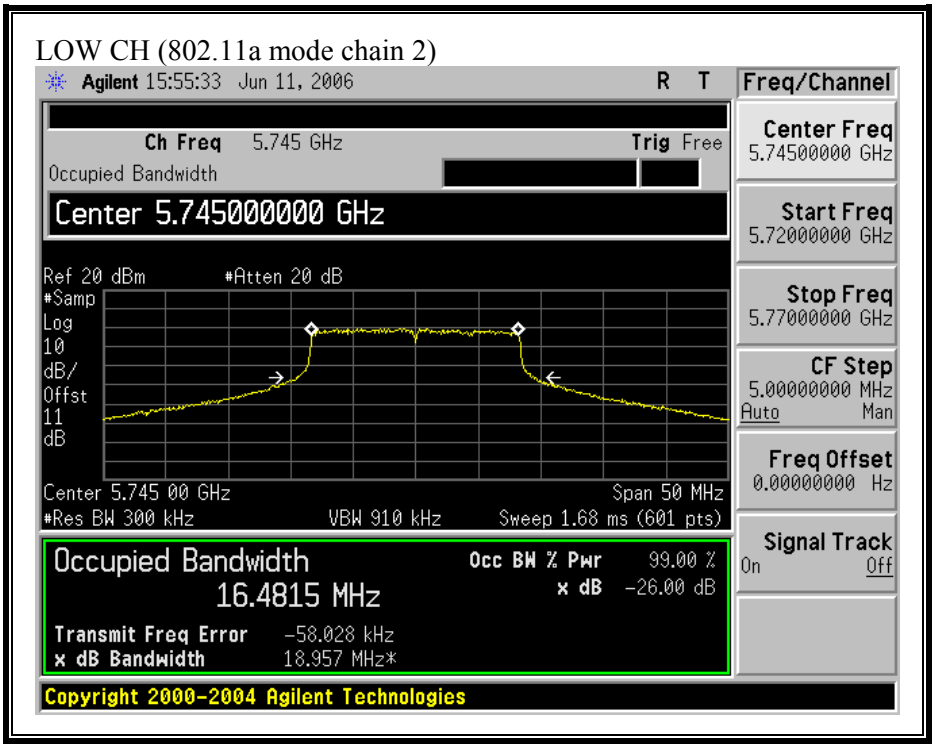


HIGH CH (802.11a mode chain 0)

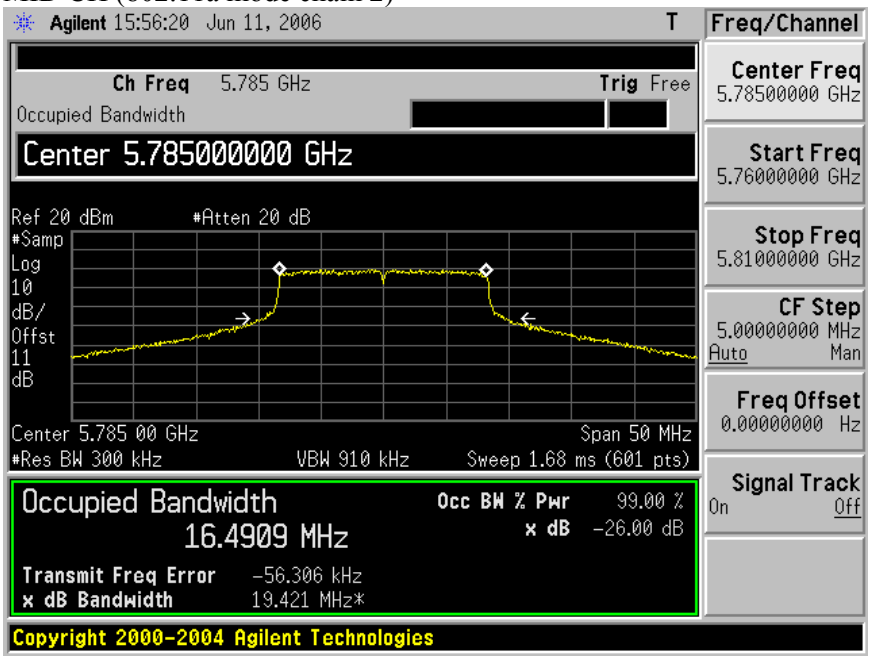


(802.11a MODE CHAIN 2)

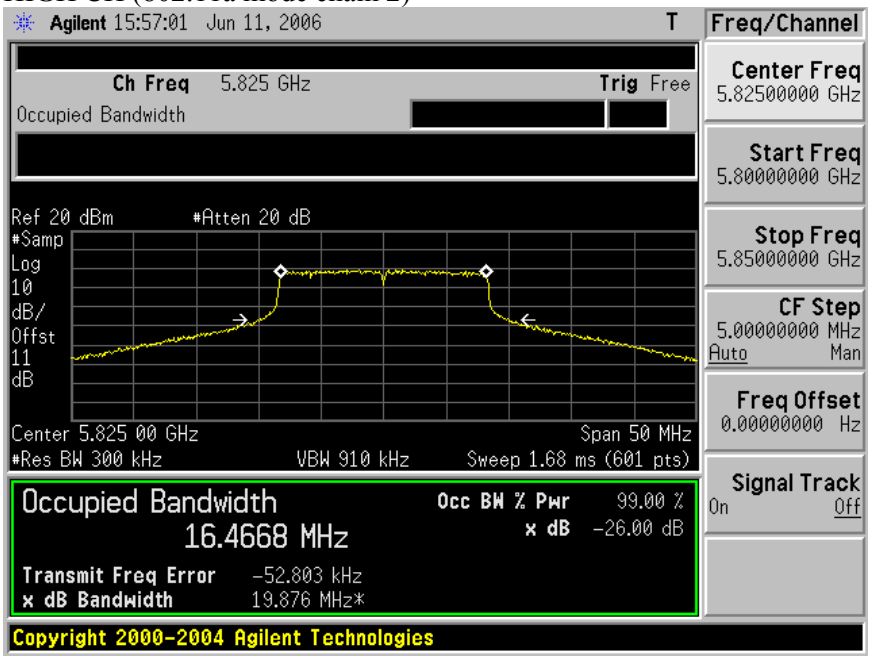
LOW CH (802.11a mode chain 2)



MID CH (802.11a mode chain 2)

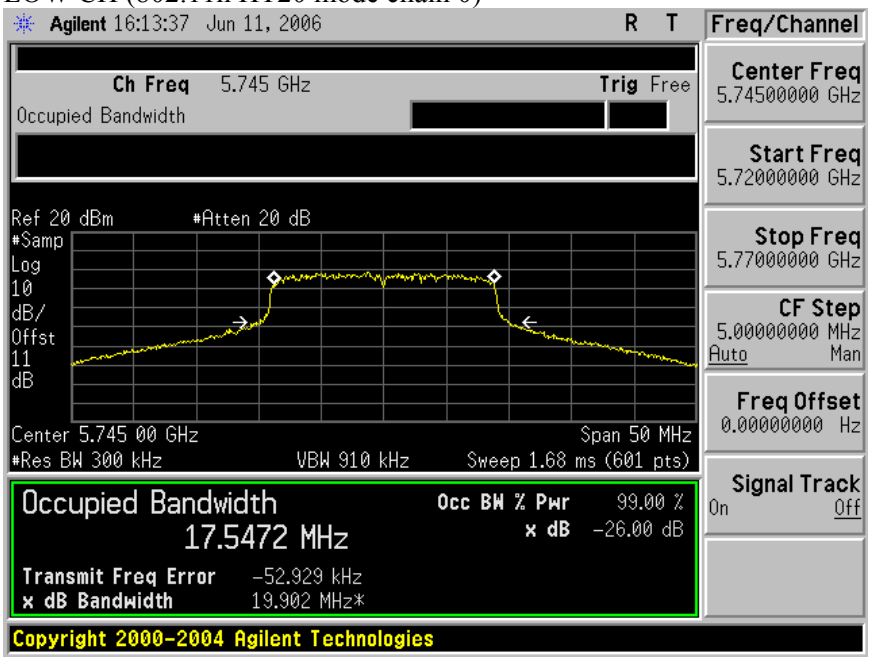


HIGH CH (802.11a mode chain 2)

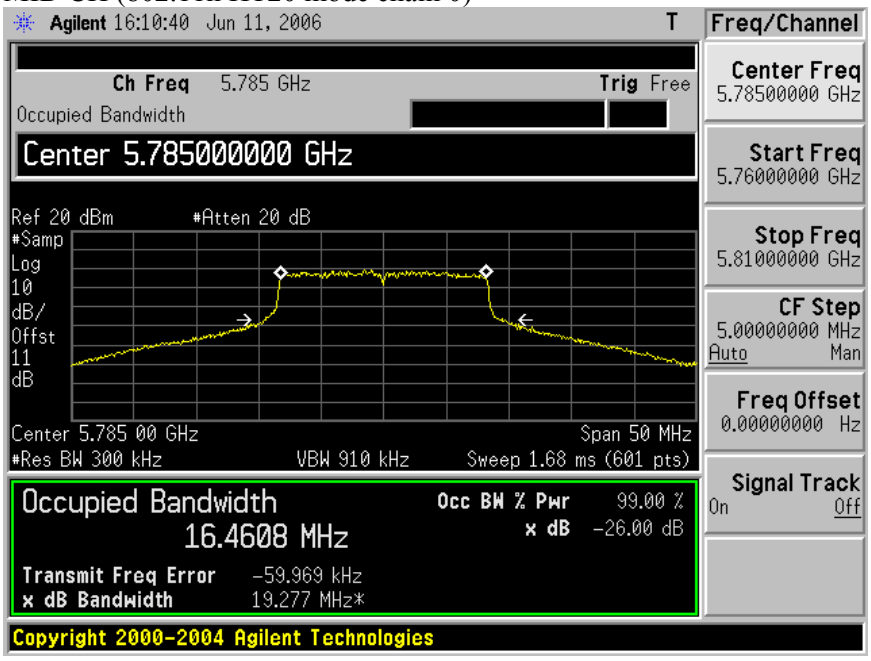


(802.11n HT20 MODE CHAIN 0)

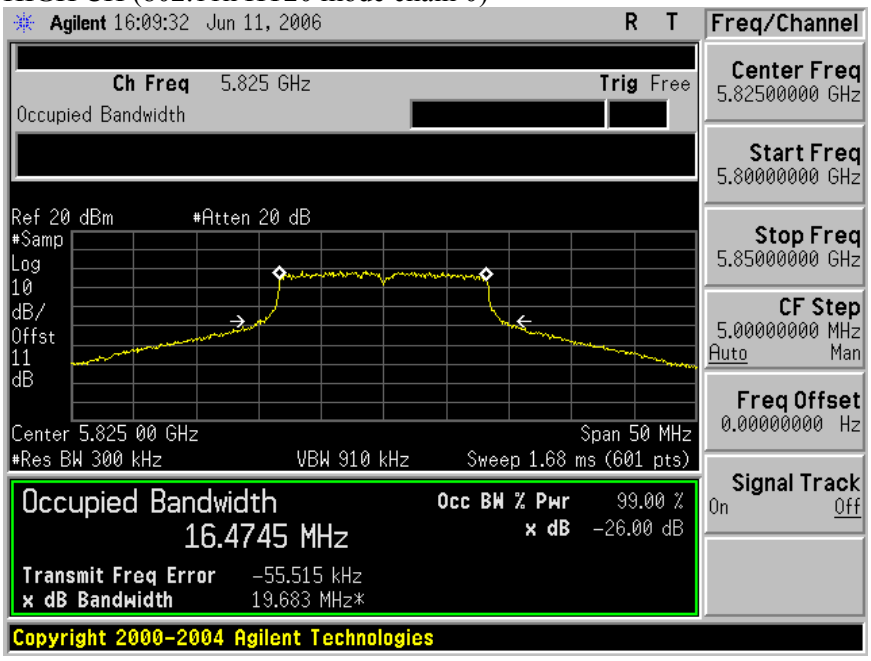
LOW CH (802.11n HT20 mode chain 0)



MID CH (802.11n HT20 mode chain 0)

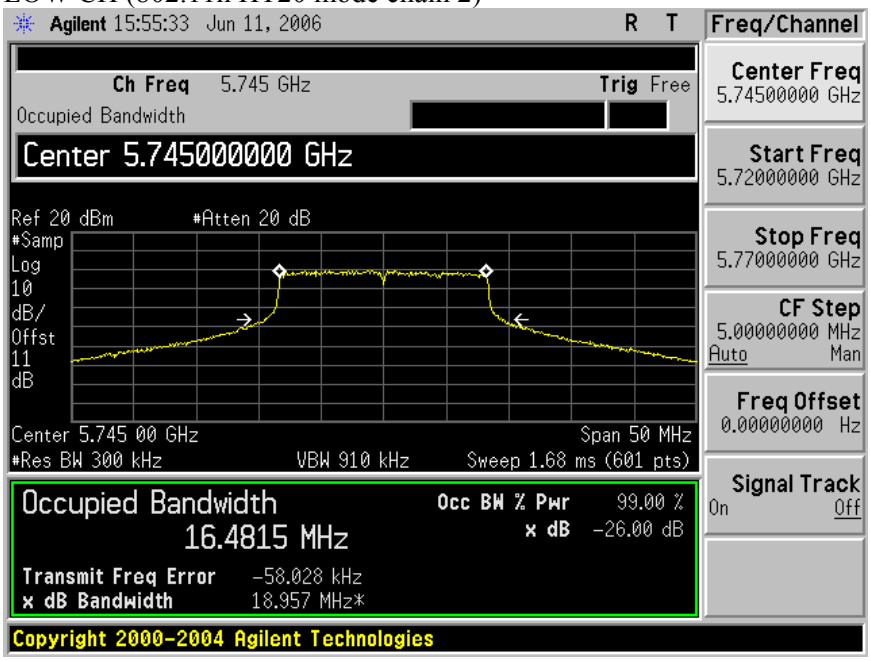


HIGH CH (802.11n HT20 mode chain 0)

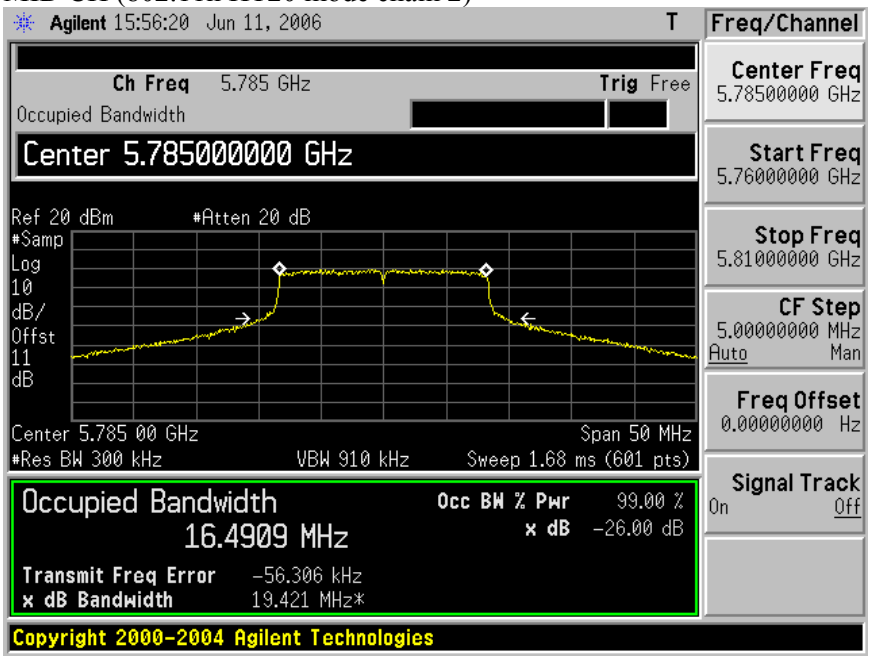


(802.11 HT20 MODE CHAIN 2)

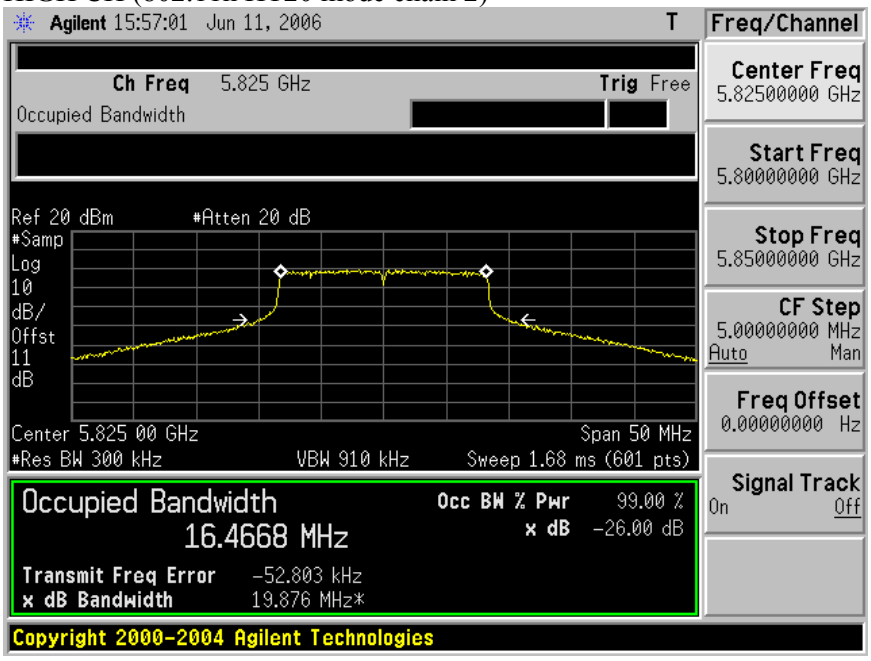
LOW CH (802.11n HT20 mode chain 2)



MID CH (802.11n HT20 mode chain 2)

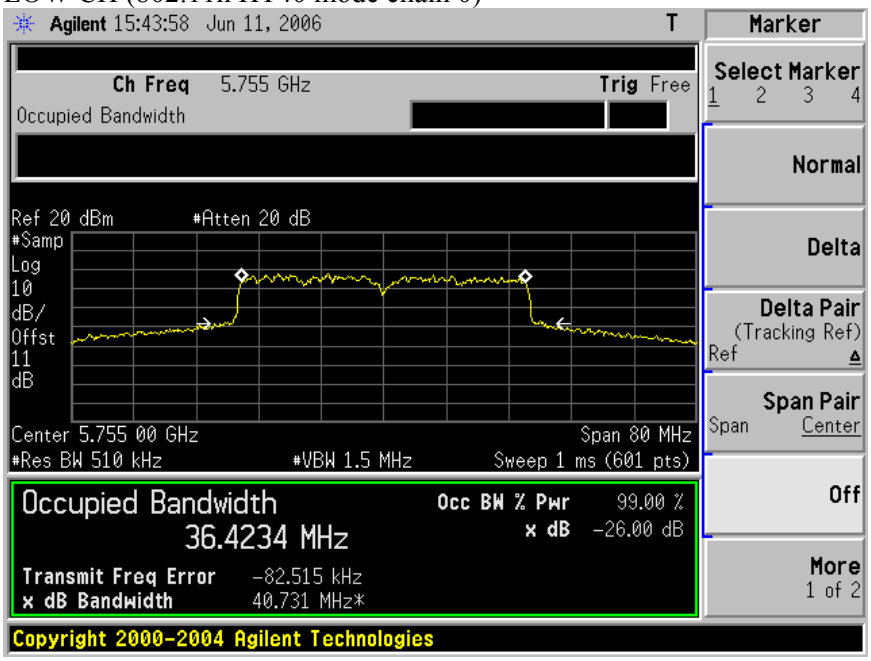


HIGH CH (802.11n HT20 mode chain 2)

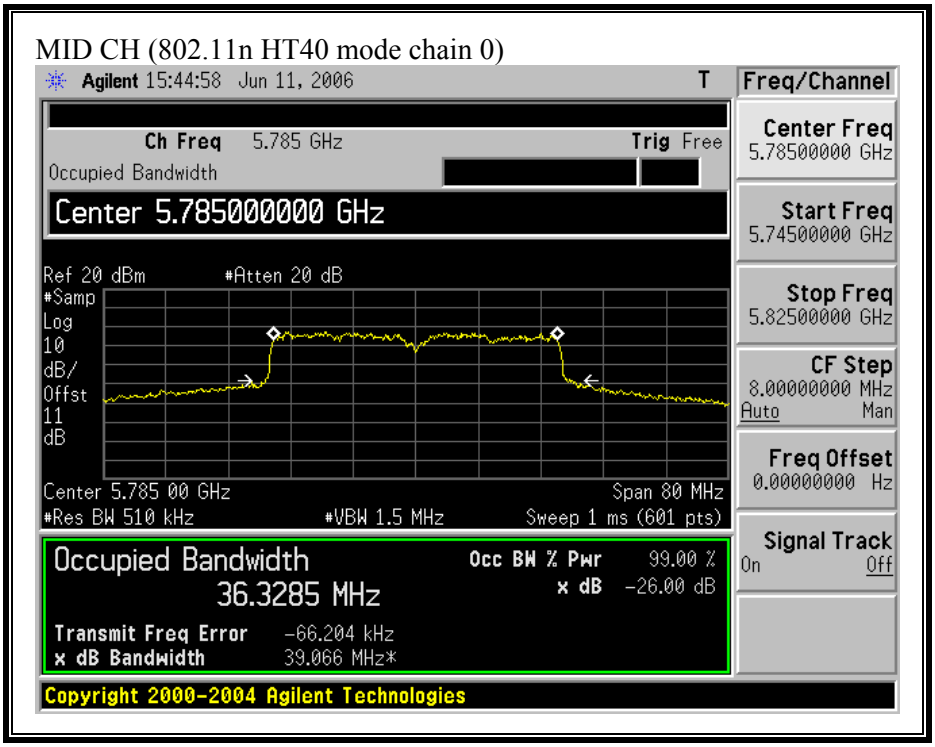


(802.11 HT40 MODE CHAIN 0)

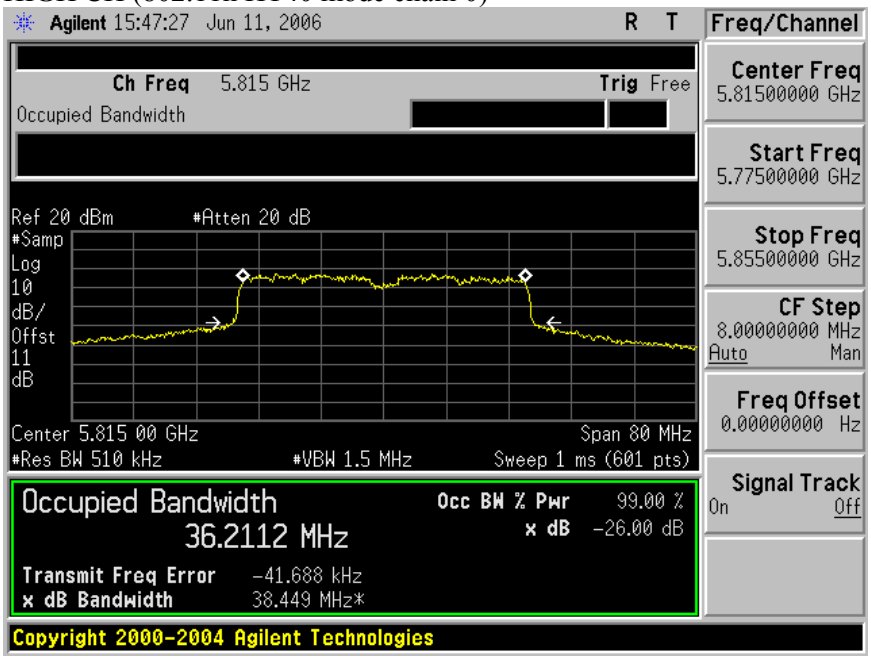
LOW CH (802.11n HT40 mode chain 0)



MID CH (802.11n HT40 mode chain 0)

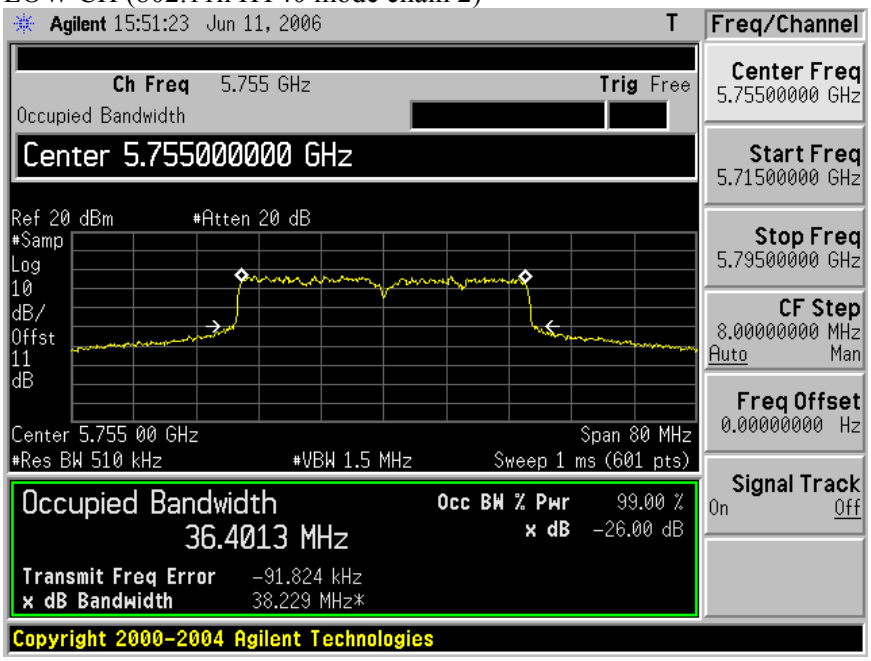


HIGH CH (802.11n HT40 mode chain 0)

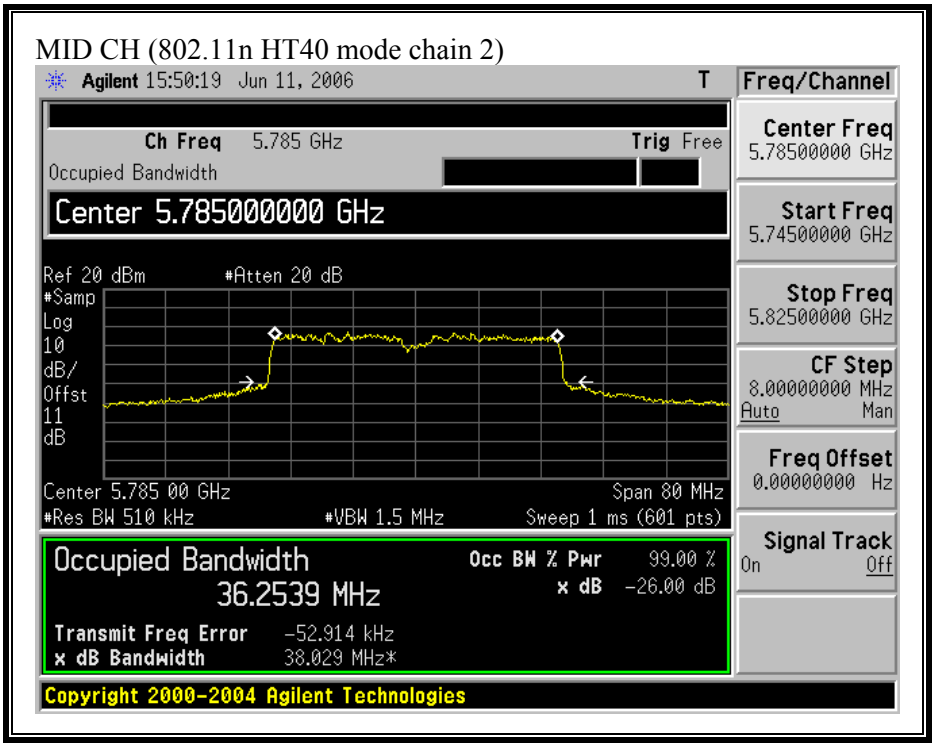


(802.11 HT40 MODE CHAIN 2)

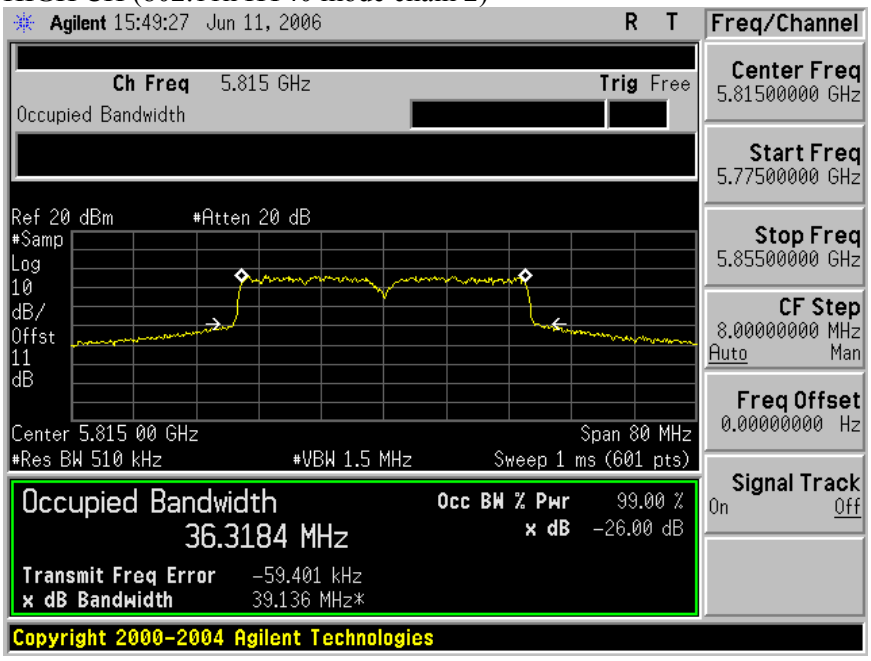
LOW CH (802.11n HT40 mode chain 2)



MID CH (802.11n HT40 mode chain 2)



HIGH CH (802.11n HT40 mode chain 2)



7.2.3. MAXIMUM OUTPUT POWER

LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The test is performed in accordance with Option 2 procedures in FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The transmitter operates continuously therefore Method # 1 is used.

Each chain is measured separately and the total power is calculated using:

Total Power = 10 log (10^ (Chain 0 Power / 10) + 10^ (Chain 2 Power / 10))

RESULTS

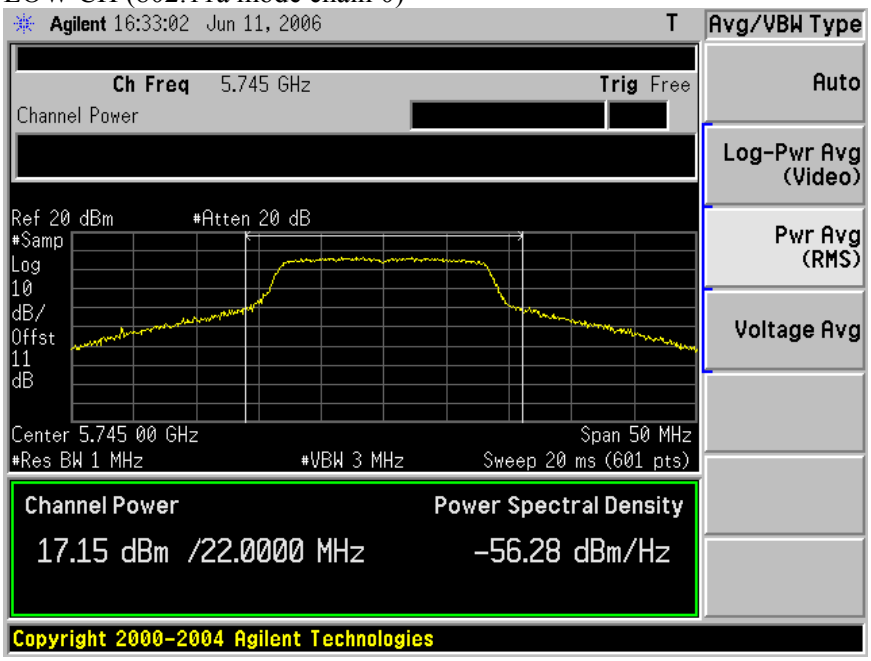
The maximum antenna gain is 4.76 dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm. In the legacy mode, the effective antenna gain is 4.76 + 10*Log(2) = 7.77 dBi.

No non-compliance noted:

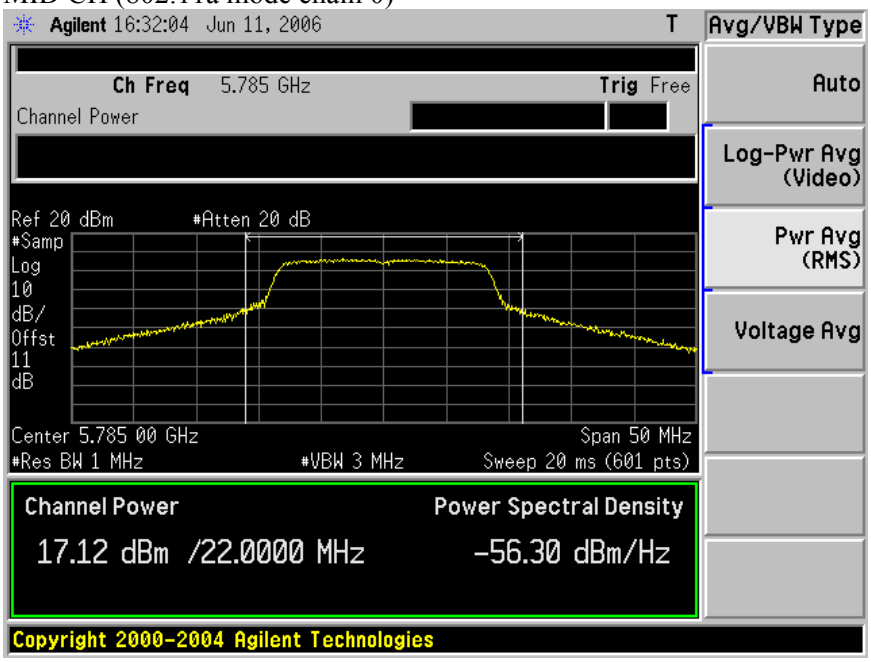
Mode Channel	Frequency (MHz)	Max Power Chain 0 (dBm)	Max Power Chain 2 (dBm)	Max Power Total (dBm)	Limit (dBm)	Margin (dB)
802.11a Mode						
Low	5745	17.15	17.27	20.22	28.2	-8.01
Middle	5785	17.12	17.20	20.17	28.2	-8.06
High	5825	17.33	16.89	20.13	28.2	-8.10
802.11n HT20 Mode						
Low	5745	17.18	17.00	20.10	30.0	-9.90
Middle	5785	17.10	17.26	20.19	30.0	-9.81
High	5825	17.26	17.15	20.22	30.0	-9.78
802.11n HT40 Mode						
Low	5755	17.18	16.97	20.09	30.0	-9.91
Middle	5785	17.29	17.08	20.20	30.0	-9.80
High	5815	17.12	17.12	20.13	30.0	-9.87

(802.11a MODE CHAIN 0)

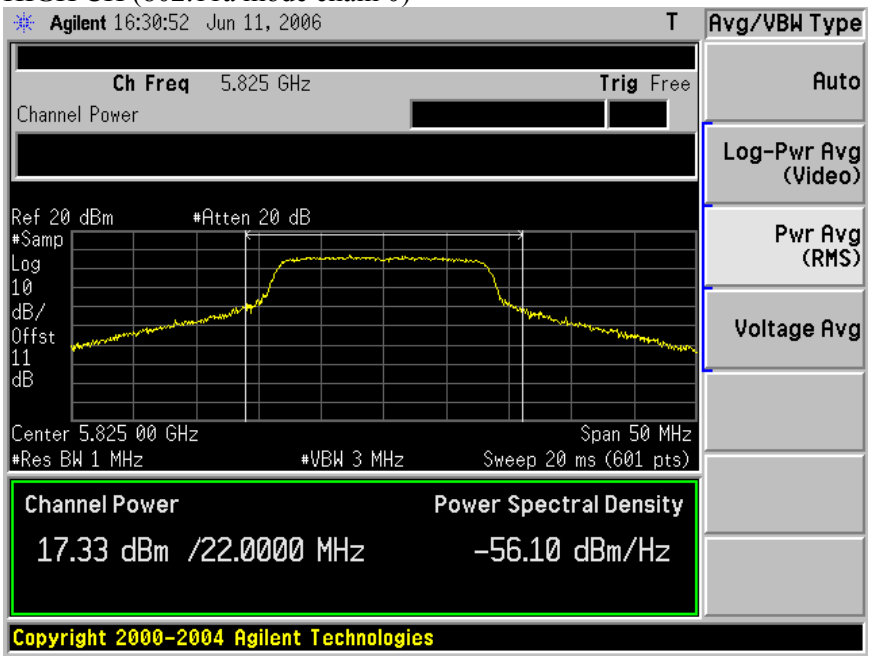
LOW CH (802.11a mode chain 0)



MID CH (802.11a mode chain 0)

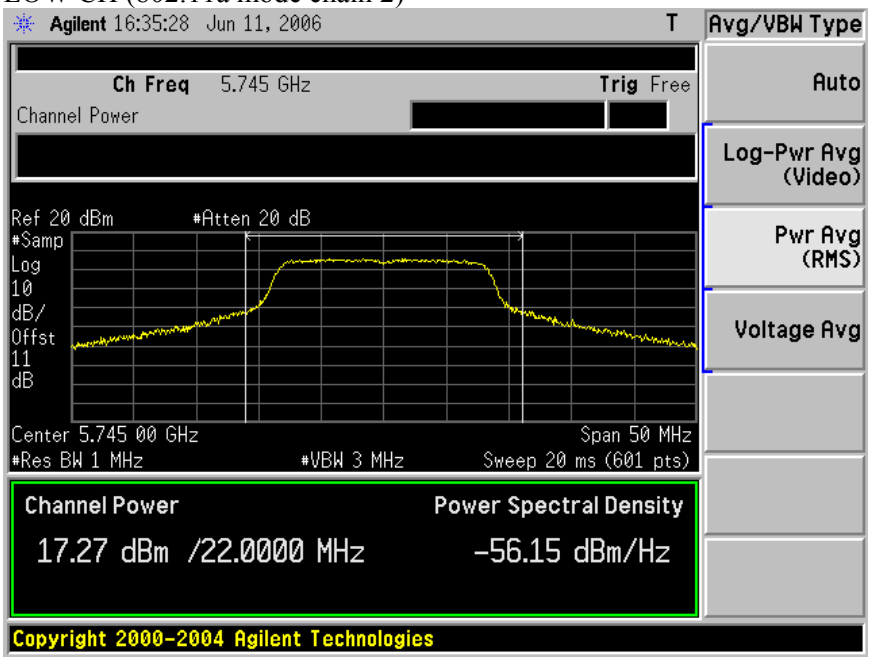


HIGH CH (802.11a mode chain 0)

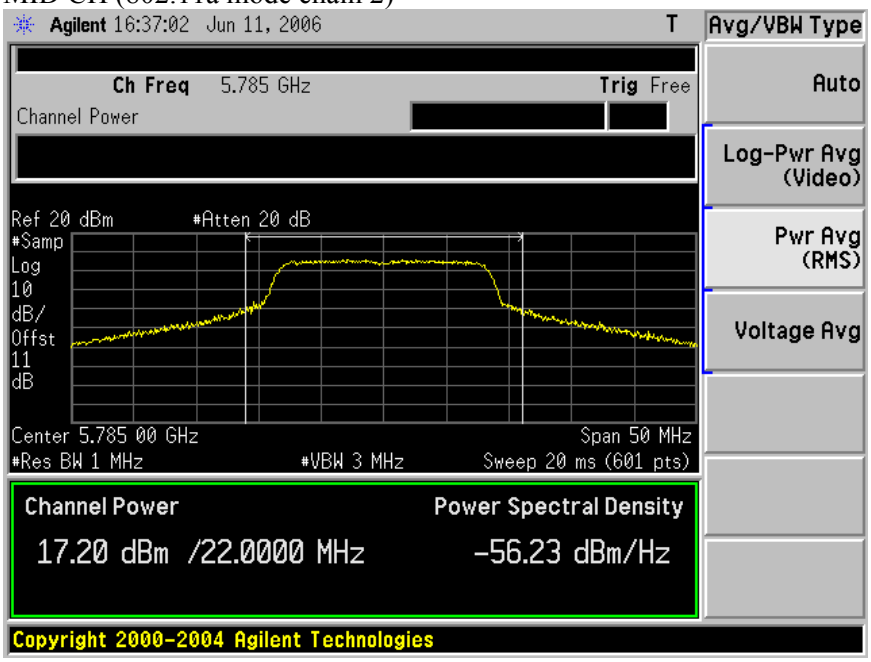


(802.11a MODE CHAIN 2)

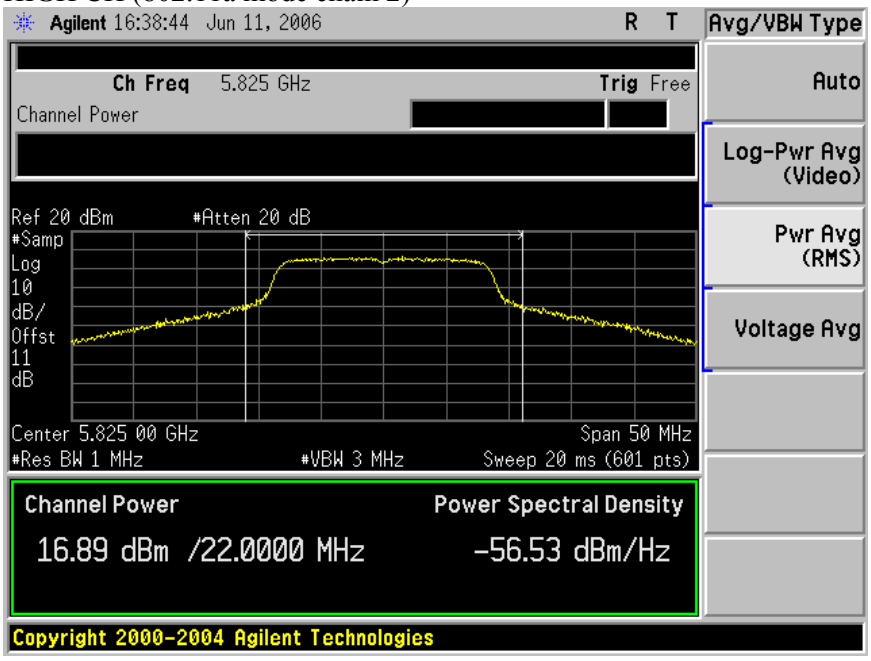
LOW CH (802.11a mode chain 2)



MID CH (802.11a mode chain 2)

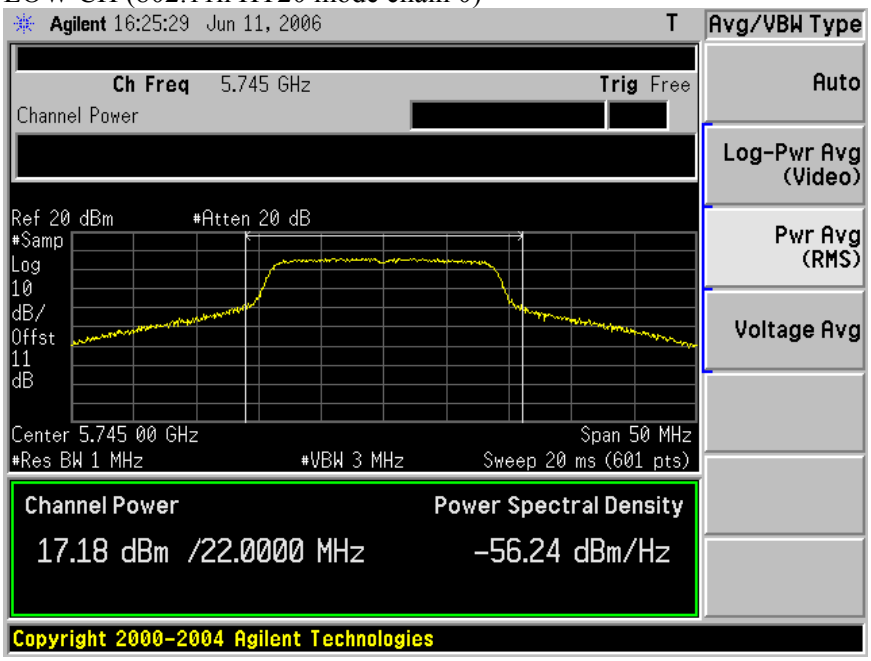


HIGH CH (802.11a mode chain 2)

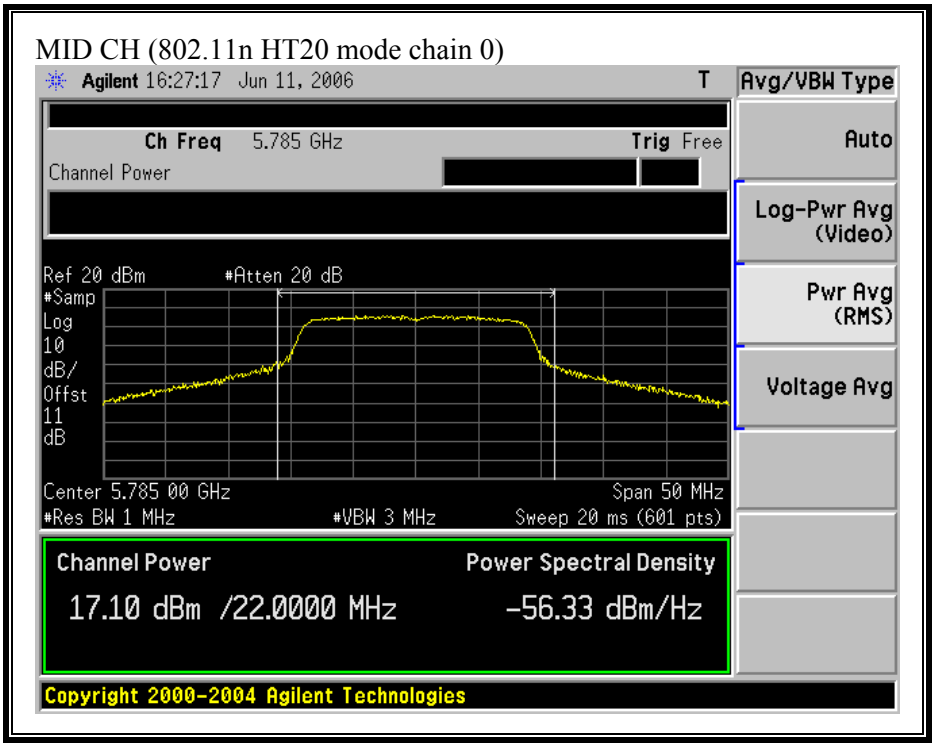


(802.11n HT20 MODE CHAIN 0)

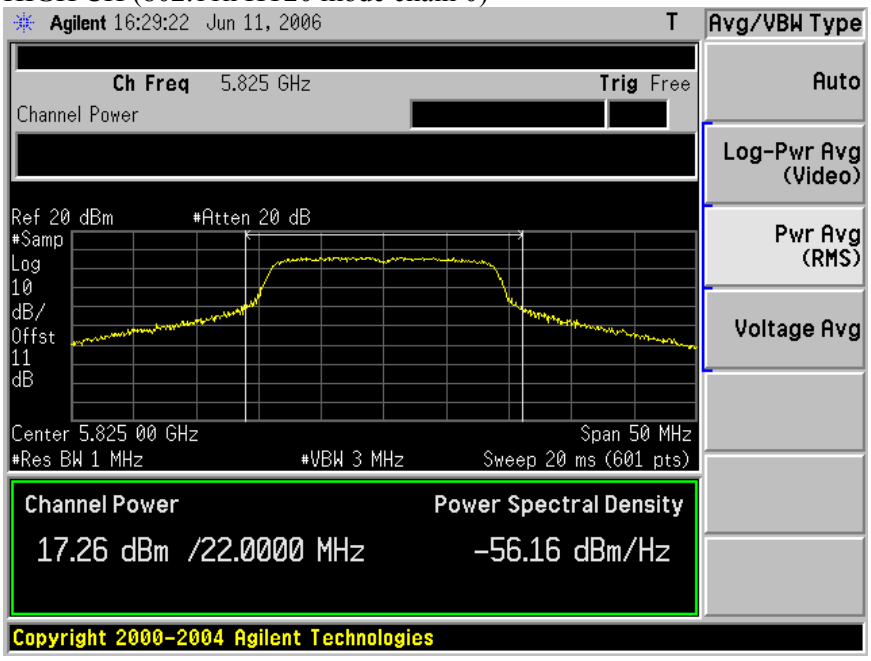
LOW CH (802.11n HT20 mode chain 0)



MID CH (802.11n HT20 mode chain 0)

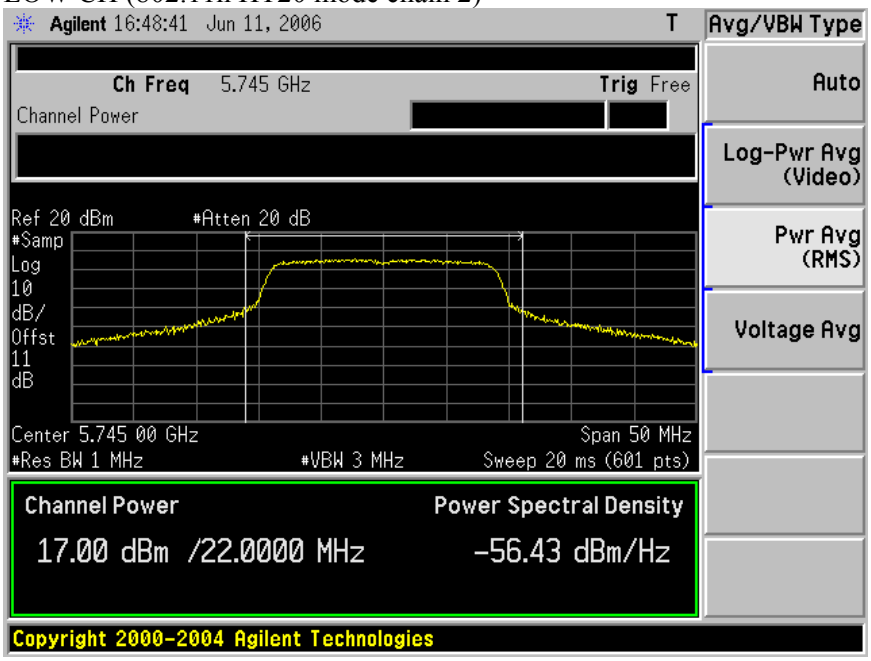


HIGH CH (802.11n HT20 mode chain 0)

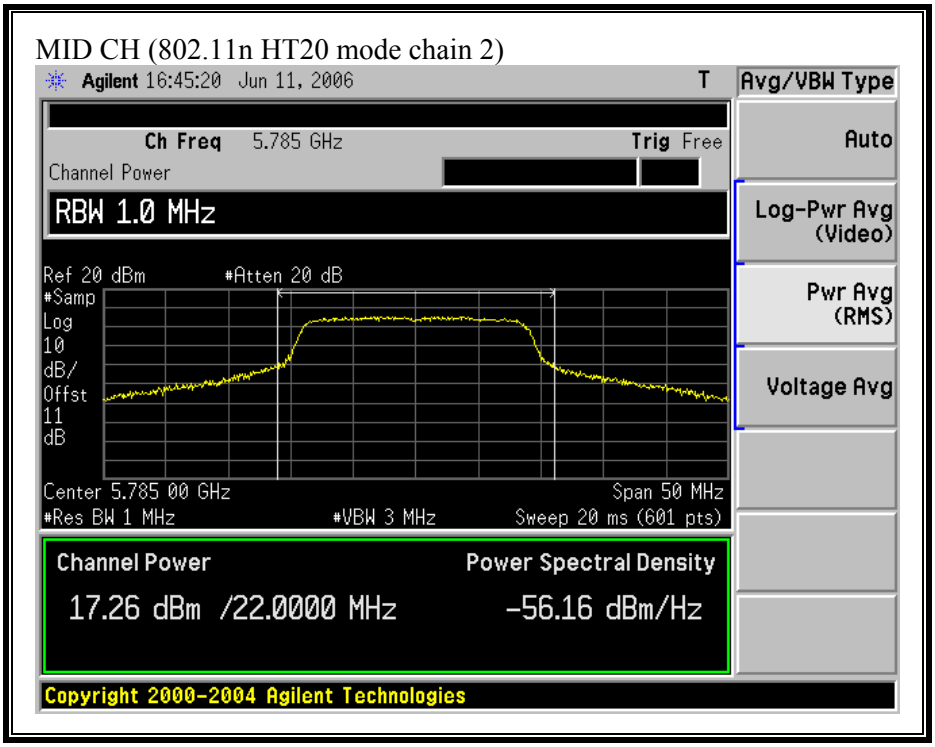


(802.11 HT20 MODE CHAIN 2)

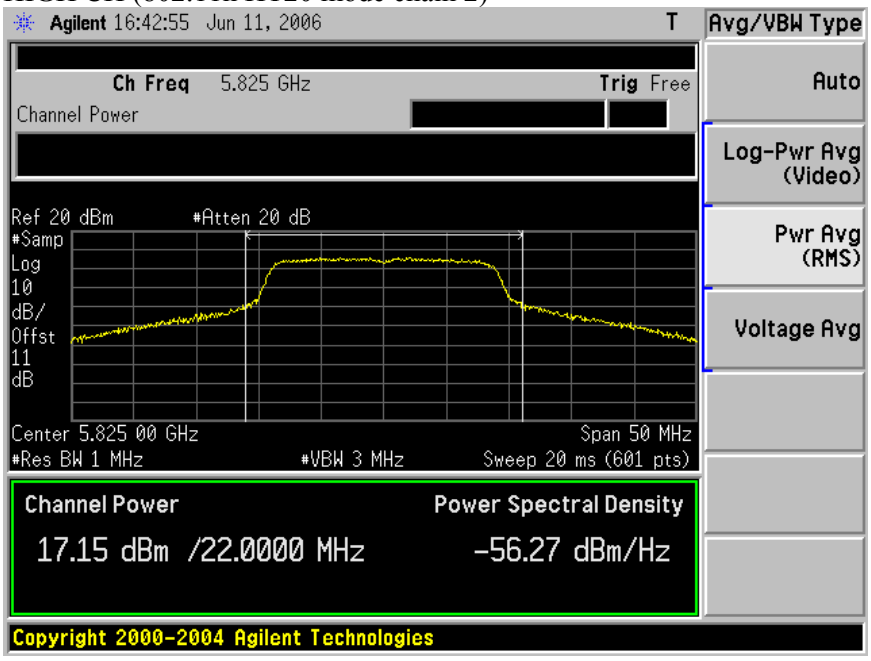
LOW CH (802.11n HT20 mode chain 2)



MID CH (802.11n HT20 mode chain 2)

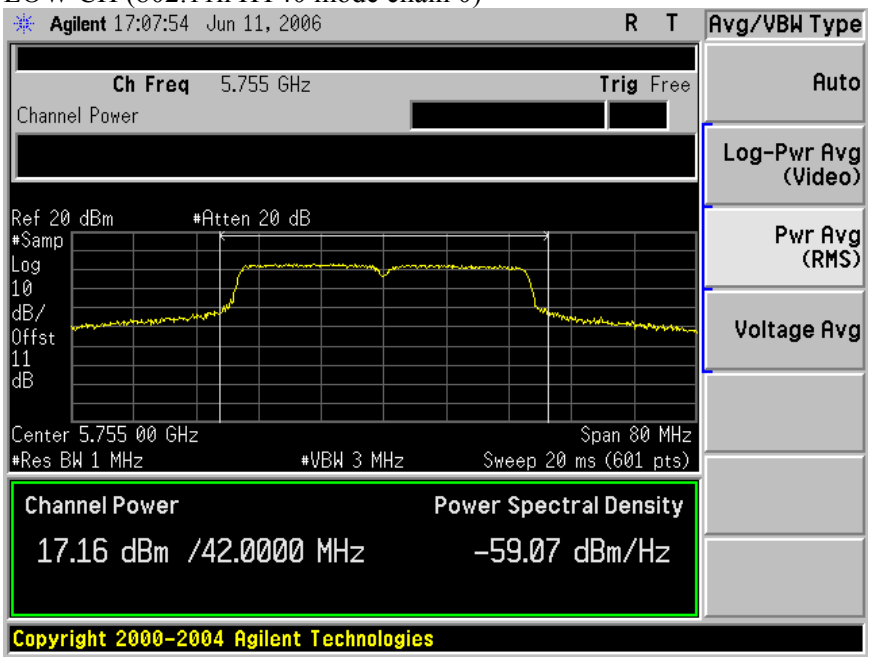


HIGH CH (802.11n HT20 mode chain 2)

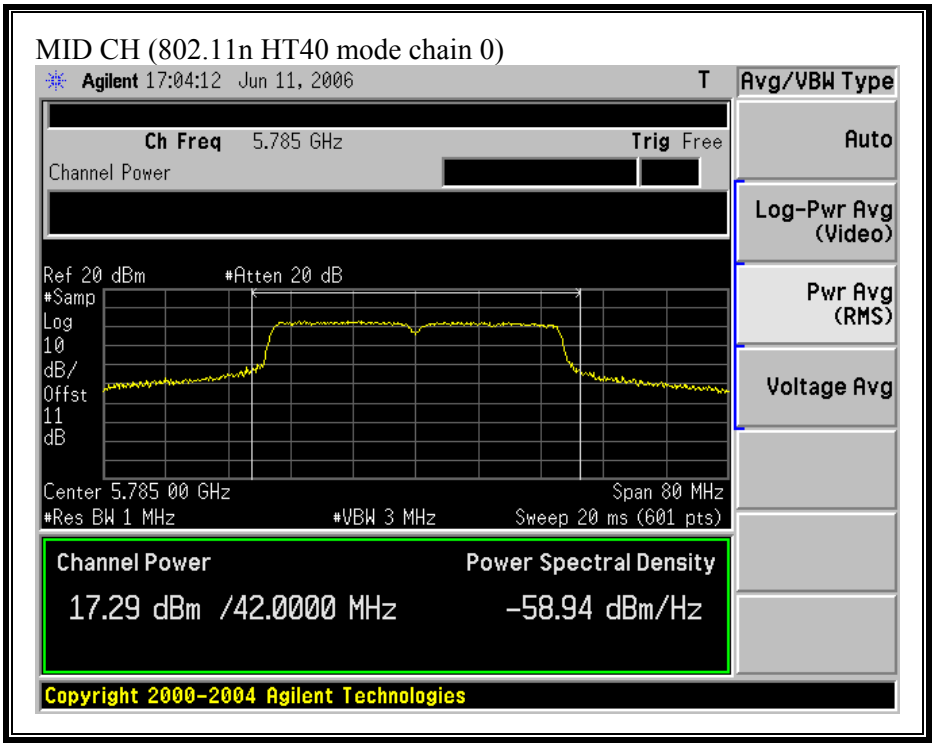


(802.11 HT40 MODE CHAIN 0)

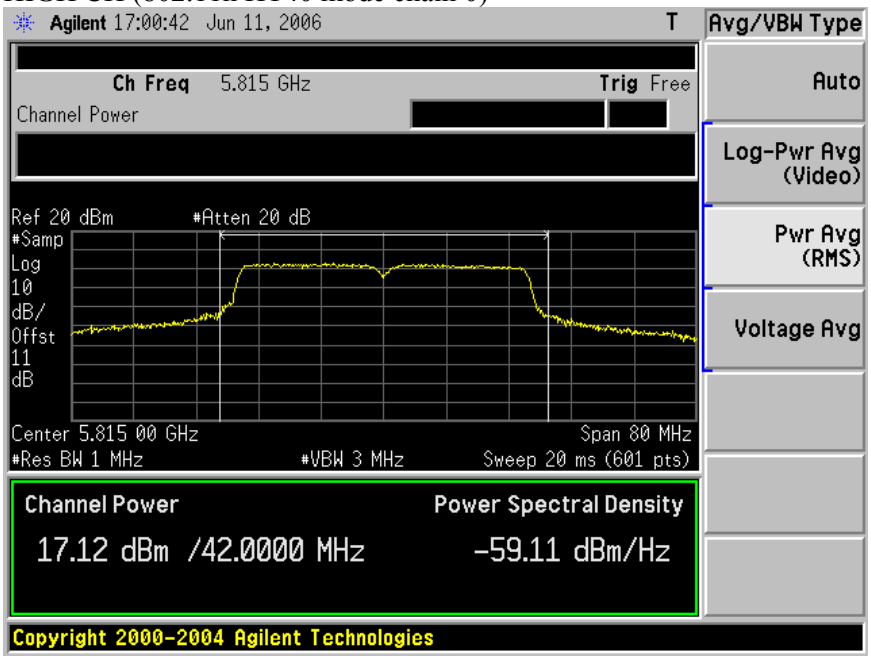
LOW CH (802.11n HT40 mode chain 0)



MID CH (802.11n HT40 mode chain 0)

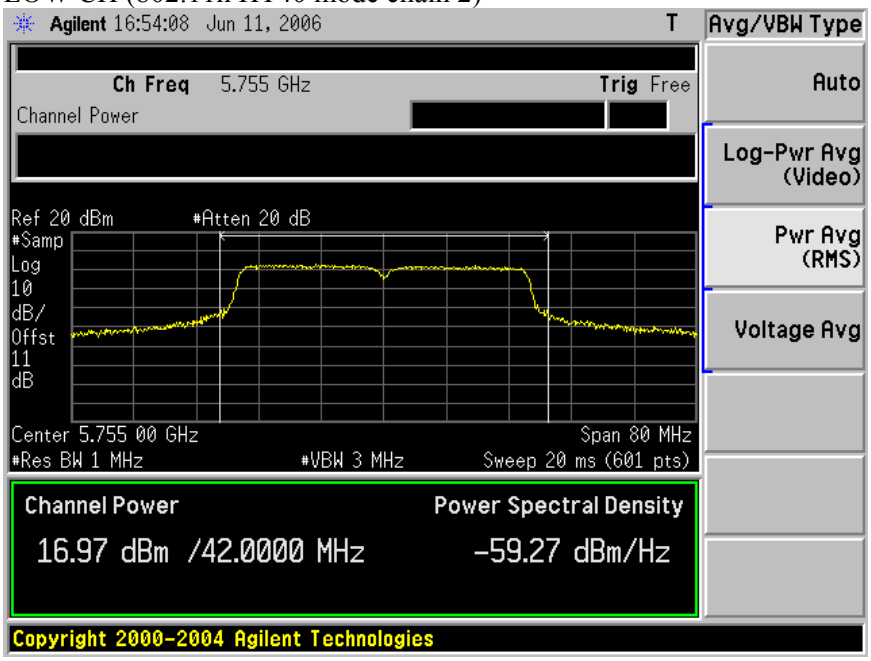


HIGH CH (802.11n HT40 mode chain 0)

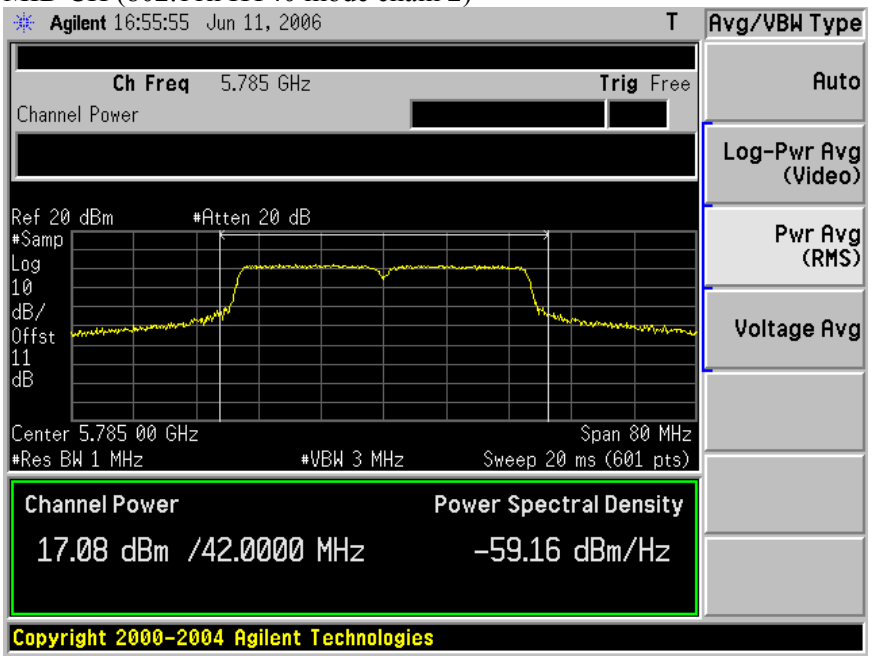


(802.11 HT40 MODE CHAIN 2)

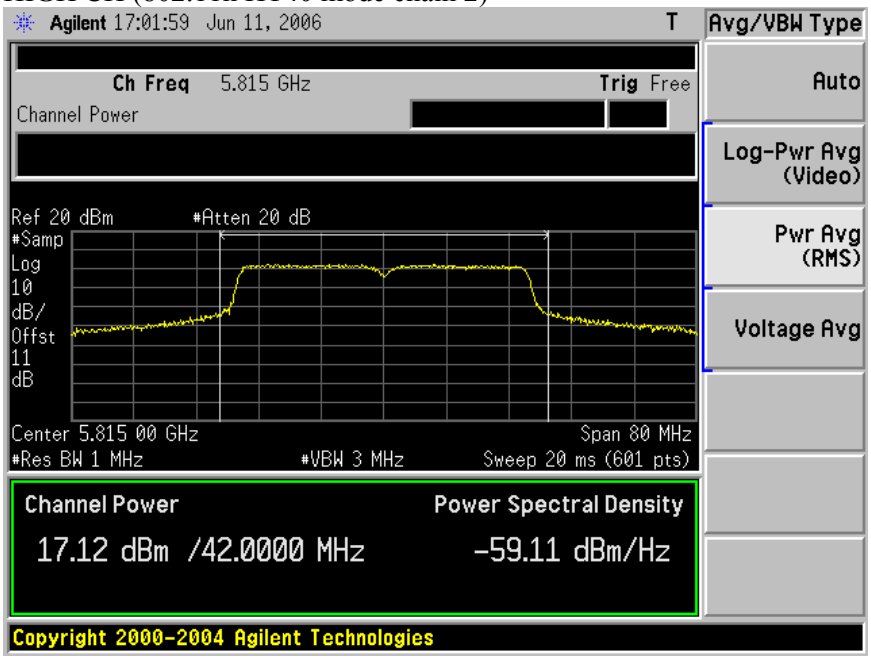
LOW CH (802.11n HT40 mode chain 2)



MID CH (802.11n HT40 mode chain 2)



HIGH CH (802.11n HT40 mode chain 2)



7.2.4. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

Each chain is measured separately and the total power is calculated using:

Total Power = 10 log (10^ (Chain 0 Power / 10) + 10^ (Chain 2 Power / 10))

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Mode Channel	Frequency (MHz)	Average Power Chain 0 (dBm)	Average Power Chain 2 (dBm)	Average Power Total (dBm)
802.11a Mode				
Low	5745	16.90	16.65	19.8
Middle	5785	16.85	16.74	19.8
High	5825	17.01	16.90	20.0
802.11n HT20 Mode				
Low	5745	16.79	16.40	19.6
Middle	5785	16.75	16.30	19.5
High	5825	16.86	16.25	19.6
802.11n HT40 Mode				
Low	5755	16.35	16.95	19.7
Middle	5785	16.26	16.89	19.6
High	5815	16.25	16.85	19.6

7.2.5. PEAK POWER SPECTRAL DENSITY

LIMIT

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The test is performed in accordance with Option 2 procedures in FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The conditions for sample detection are satisfied. The PPSD is the highest level found across the emission in any 3 kHz band.

Each chain is measured separately and the total PPSD is calculated using:

Total PPSD = 10 log (10^ (Chain 0 PPSD / 10) + 10^ (Chain 2 PPSD / 10))

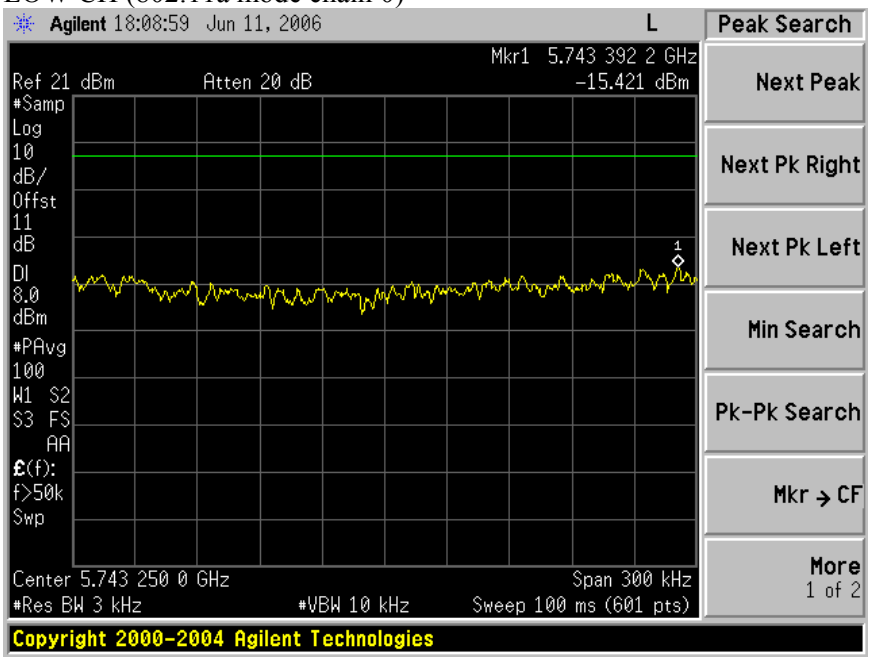
RESULTS

No non-compliance noted:

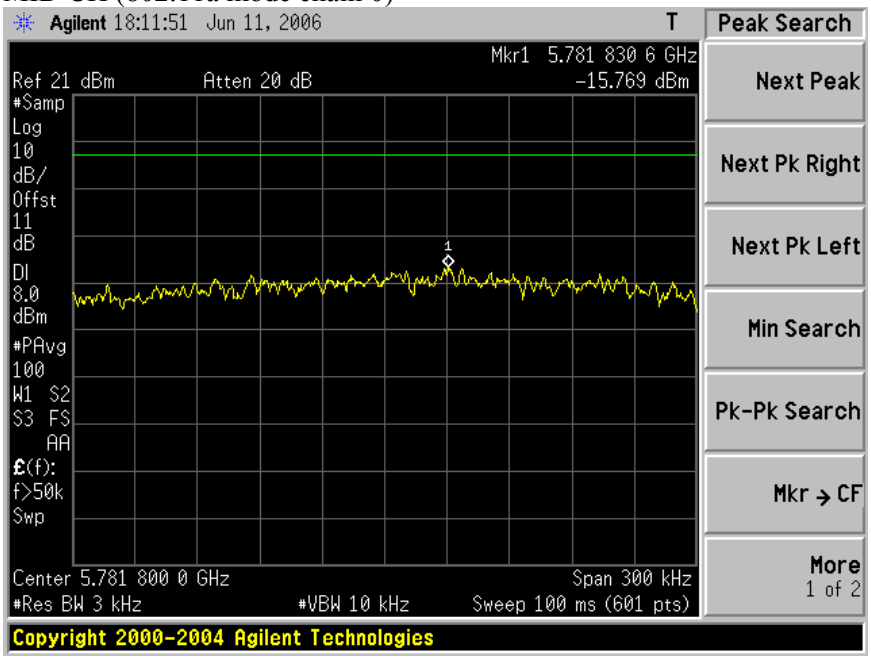
Mode Channel	Frequency (MHz)	PPSD Chain 0 (dBm)	PPSD Chain 2 (dBm)	PPSD Total (dBm)	Limit (dBm)	Margin (dB)
802.11a Mode						
Low	5745	-15.42	-17.37	-13.28	8	-21.28
Middle	5785	-15.77	-16.23	-12.98	8	-20.98
High	5825	-15.09	-17.06	-12.95	8	-20.95
802.11n HT20 Mode						
Low	5745	-15.82	-17.37	-13.52	8	-21.52
Middle	5785	-15.56	-18.34	-13.72	8	-21.72
High	5825	-15.09	-16.98	-12.92	8	-20.92
802.11n HT40 Mode						
Low	5755	-16.24	-17.53	-13.82	8	-21.82
Middle	5785	-17.80	-16.77	-14.25	8	-22.25
High	5815	-17.31	-18.17	-14.70	8	-22.70

(802.11a MODE CHAIN 0)

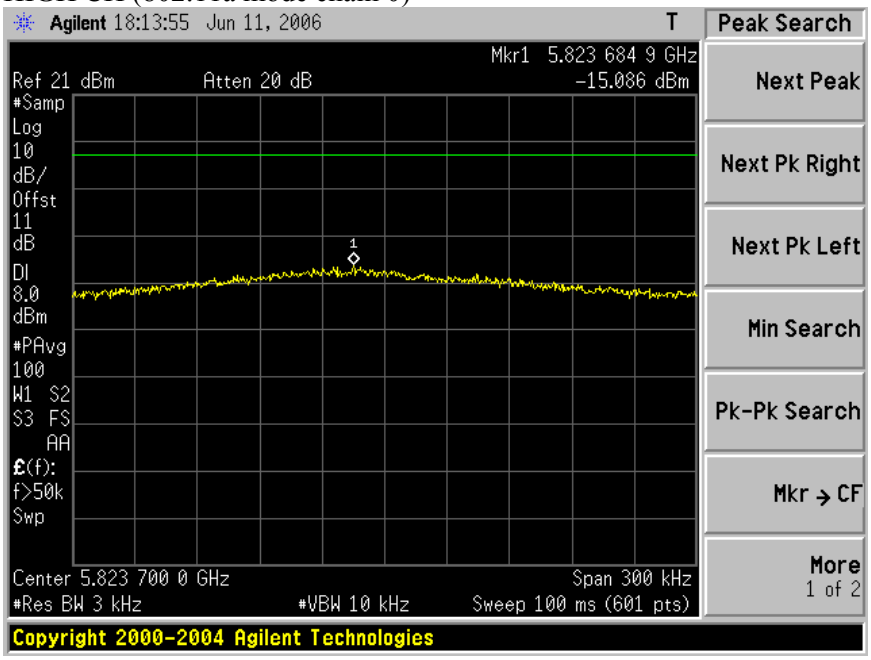
LOW CH (802.11a mode chain 0)



MID CH (802.11a mode chain 0)

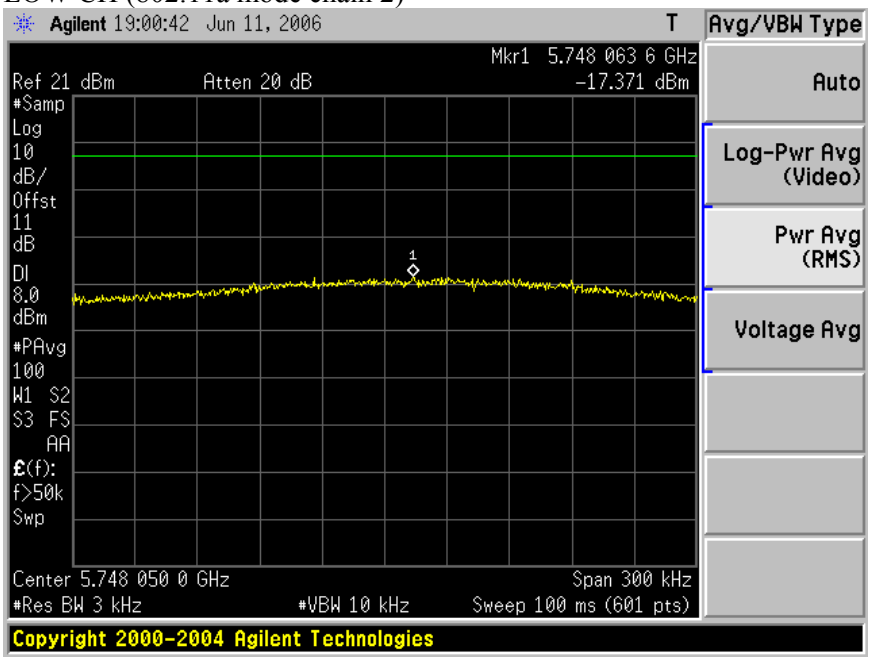


HIGH CH (802.11a mode chain 0)

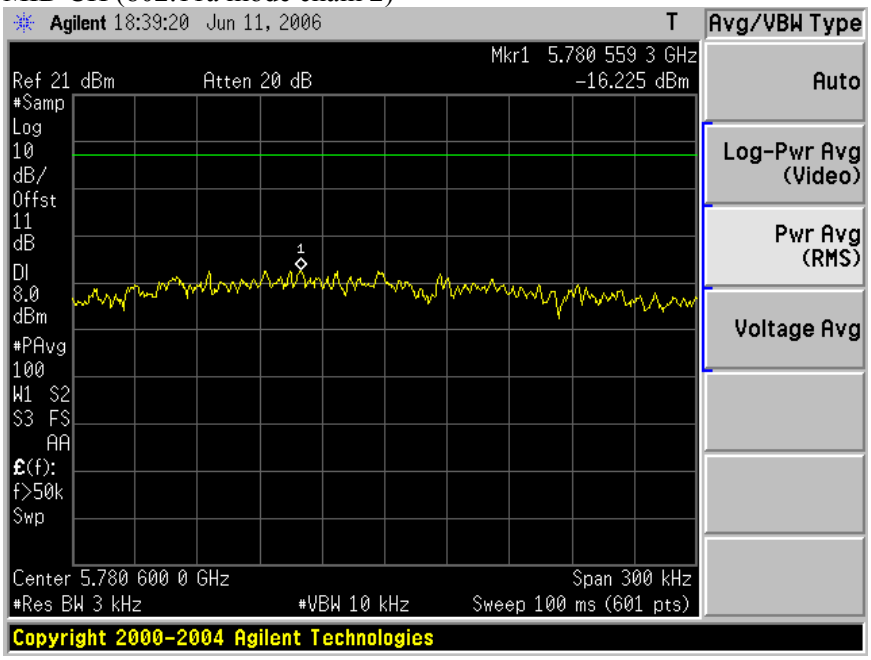


(802.11a MODE CHAIN 2)

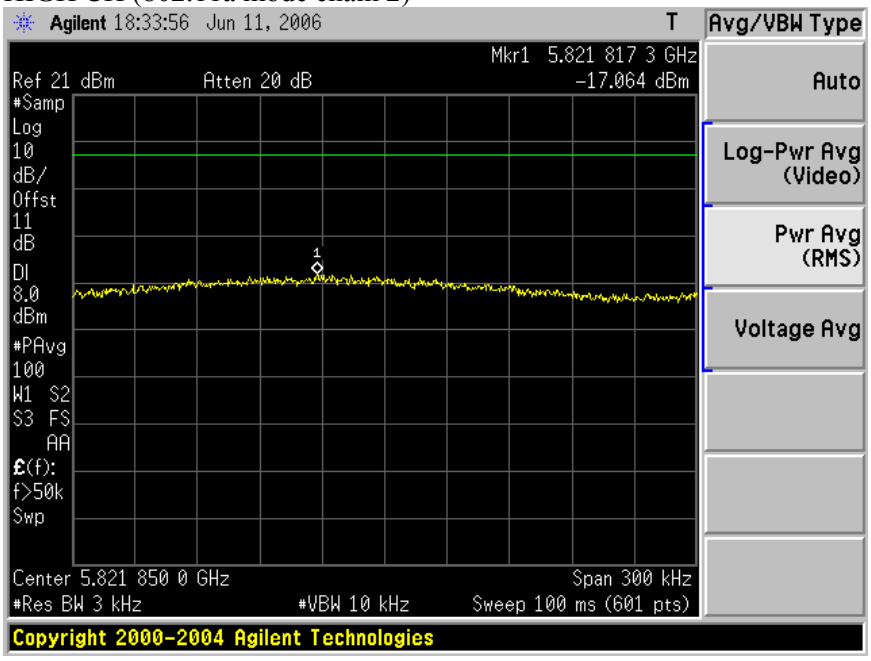
LOW CH (802.11a mode chain 2)



MID CH (802.11a mode chain 2)

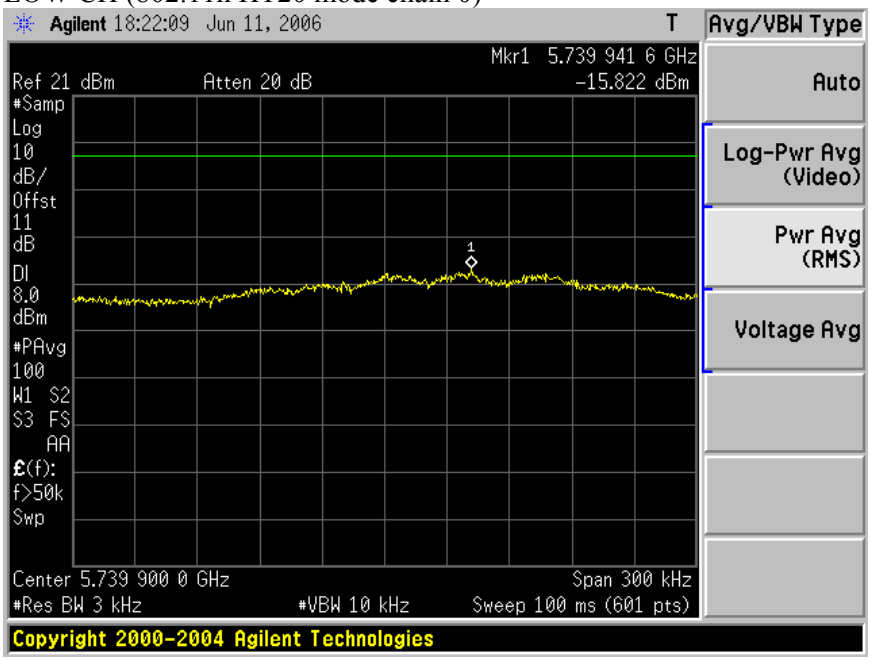


HIGH CH (802.11a mode chain 2)

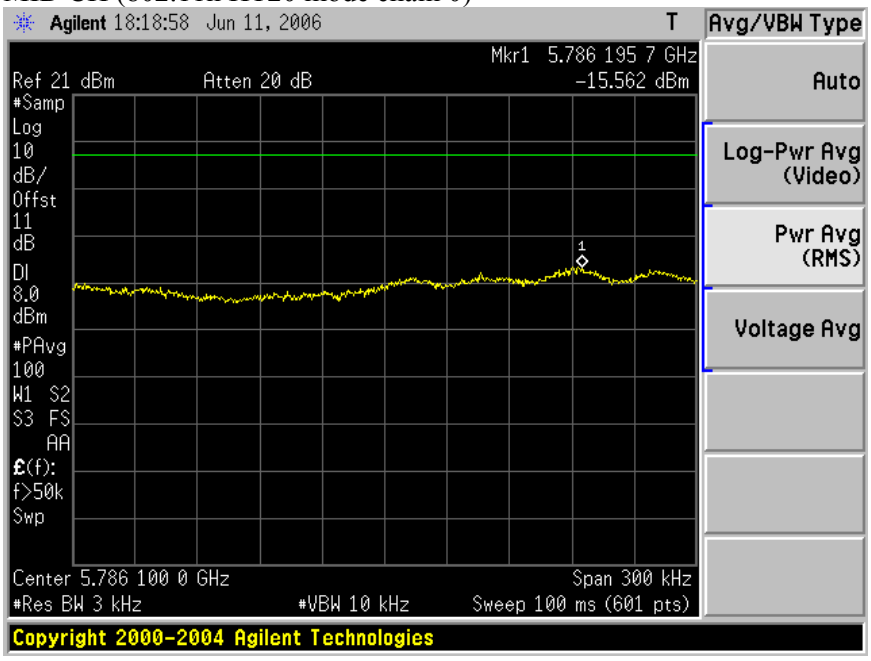


(802.11n HT20 MODE CHAIN 0)

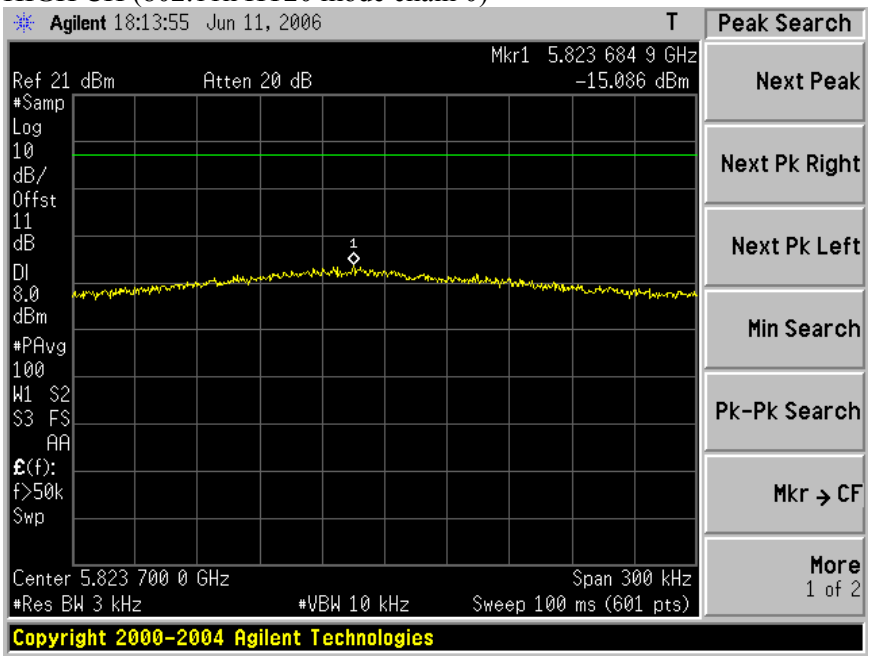
LOW CH (802.11n HT20 mode chain 0)



MID CH (802.11n HT20 mode chain 0)

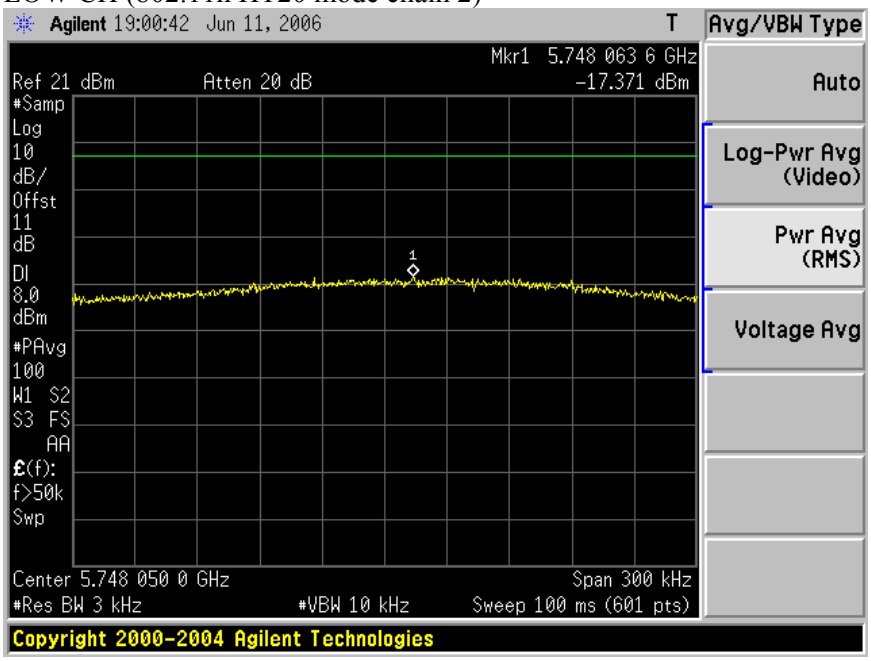


HIGH CH (802.11n HT20 mode chain 0)

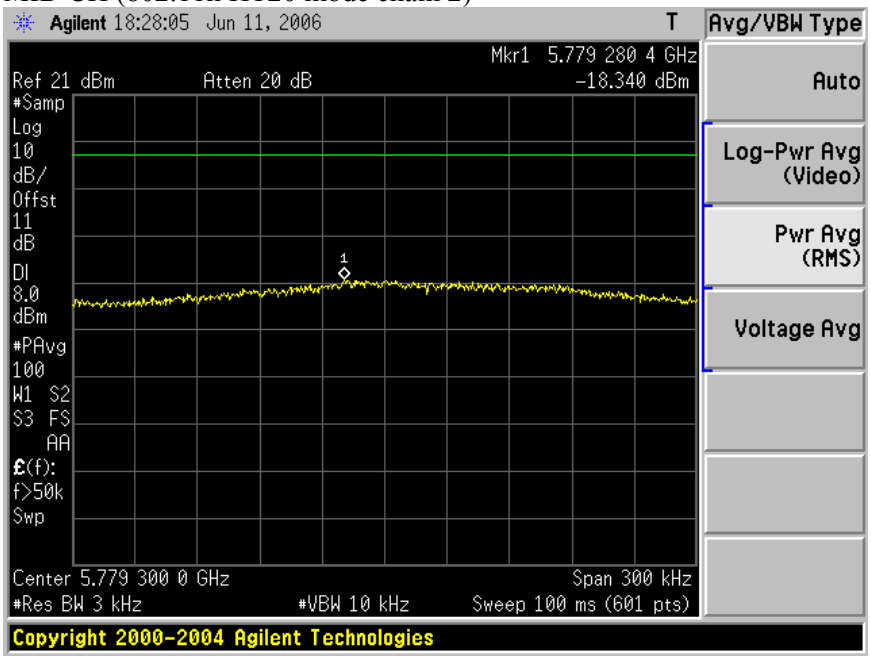


(802.11 HT20 MODE CHAIN 2)

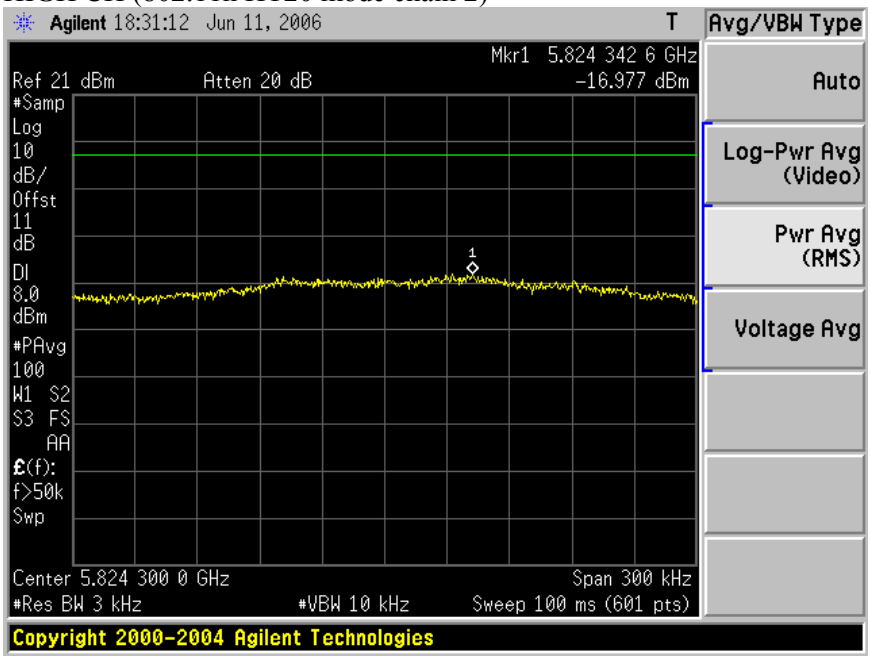
LOW CH (802.11n HT20 mode chain 2)



MID CH (802.11n HT20 mode chain 2)

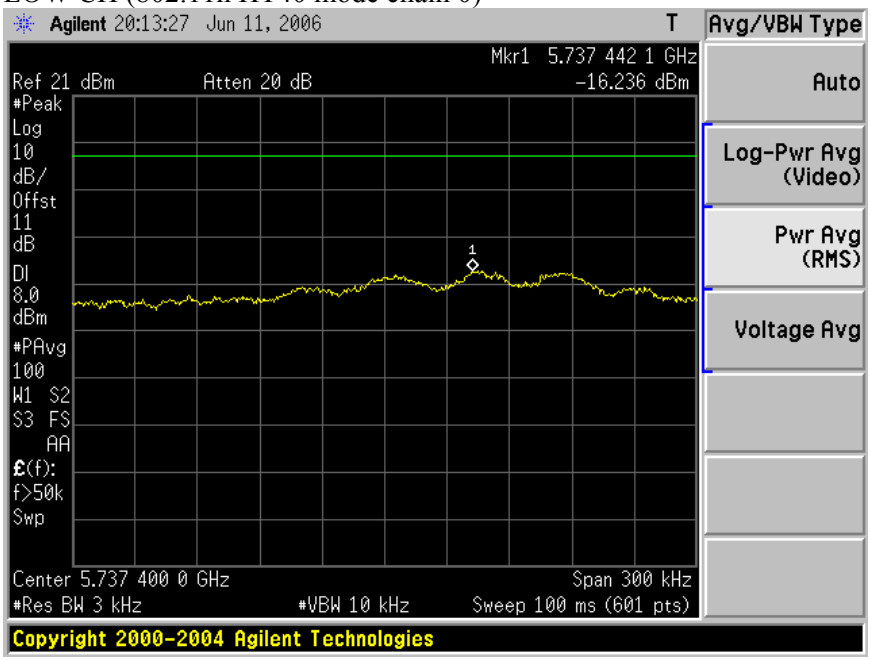


HIGH CH (802.11n HT20 mode chain 2)



(802.11 HT40 MODE CHAIN 0)

LOW CH (802.11n HT40 mode chain 0)



MID CH (802.11n HT40 mode chain 0)